JOURNAL OF THE
American Geriatrics Society

Official Journal of the American Geriatrics Society

Volume VIII *October, 1960* Number 10

THE DUAL NATURE OF AGING*

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This meeting of the American Geriatrics Society is taking place at a most opportune time, coming as it does six months before the White House Conference on Problems of Our Aging Citizens, which will convene in Washington in January, 1961. Whether we realize it or not, we are now living in the midst of a profound biological and social revolution. The world is rapidly becoming one vast neighborhood with all of the vexing problems that may arise when neighbors of different textures, sensitivities and ambitions find themselves rubbing shoulders with one another. Accordingly, it becomes of the utmost importance for us to seek for a greater and clearer understanding of the developments which are governing ourselves and the society in which we live.

The rapid increase in membership of the American Geriatrics Society is significant evidence of the deep interest American Medicine is taking in the fascinating problems of aging.

In addition, every facet of society is responding, in one way or another, to the existence of huge numbers of older people in various stages of health, employability and financial competence. These problems are intimately inter-related. They react on each other. The impact on legislation in behalf of older citizens is very evident. The complexities which exist can only be resolved by careful partition of certain major areas from the total over-all problem of aging. Health, in our opinion, is entitled to first attention. All other phases of existence derive from the living, aging being. The better his health, the more capable he will be in meeting and solving the subsequent issues that appear in his life journey.

We are, indeed, living in a changing, progressing universe. Man's horizons are broadening with greater interest in the physical, emotional and social potentials of growing with the years. We take vigorous exception to the dour predictions of the prophets of doom who see only the degeneration and deterioration of the human body with passing time. Certainly there is a waning of physical power in the later years. This, too, can be minimized with a better appreciation of the value of exercise and physical fitness. With a recession of physical power there may be a compensatory incandescence of emotional, intellectual and social attributes which give existence in the later years its unique significance.

* Presented at the 17th Annual Meeting, The American Geriatrics Society, Americana Hotel, Miami Beach, Florida, June 9 and 10, 1960.

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In an endeavor to arrive at a broad appraisal of the older individual at his best, we have utilized a working hypothesis for on-going man. This can be stated in a simple formula:

$$\frac{\text{ENERGY}}{\text{DIFFUSION}} + \text{MOTIVATION} \rightarrow \begin{matrix}\text{FITNESS} \\ \text{ACHIEVEMENT} \\ \text{FULFILLMENT.}\end{matrix}$$

Physical energy derives from food supply which is adequately utilized by the body tissues when the physiological mechanisms enjoy an optimum homeostasis. Diffusion of energy, that is, dispersion with passing time, results from disease, trauma, and adverse factors of the external and internal environments which include disuse and just plain boredom.

Motivation is demonstrated in the activities of the individual in the area of incentive and interests having social validity. With a high reserve energy component and with limited dispersion, the body is maintained in better functioning condition. A high specific motivation, as demonstrated by many persons who are enjoying to the utmost the zest of living in the later years, leads to achievement and fulfillment.

The medical profession is in a most advantageous position to evaluate the many various needs of aging citizens. By careful sifting of their requirements, some clarification will occur. By judicious analysis of the dynamics of aging and their impact on man and his society, a more adequate understanding of our aging selves will eventuate.

In probing for better ways of living the medical profession finds itself in intimate working contact with many other organized segments of society.

The pressure of environmental circumstances, housing, working conditions, recreation, retirement policies and financial status produce effects on the health, happiness and longevity of older individuals that physicians must be capable of analyzing. No other group in the population can assess the importance of these influences so accurately as can the doctors who are responsible for the health of the nation.

Aging now occupies the center of the stage; aging and national security. In fact they are closely related. Leadership in affairs is provided from the reserve of older, mature citizens possessing knowledge, experience, know-how and the vitally important intangibles implied in the word, wisdom. A strong, vibrant, alert, social order must utilize the enlightened direction of wise leaders.

Aging is a fascinating phenomenon and man, himself, is the most intriguing agent in the onward sweep of nature.

What constitutes aging? How and why do we grow old? The individual ages. Society ages. There is rhythm and beauty, but there is also deterioration, weakening, loss of drive and ultimate dissolution.

Science is probing new fields with its precision instruments in its search for a clearer understanding of the nature of man and the world in which we live. All of a sudden we find our curious and eager, learned scholars exploring outer space. They predict that within one or two decades interplanetary travel will be possible. Meanwhile, biological research is seeking the control of the destructive

forces which limit the natural life of man. There is this remarkable, ever-present will to live existing in the basic make-up of each living creature. There is the drive to keep on living. So it is with society. Man in his social organization has a compulsion to keep on living and growing. He yearns for continuity and security. What factors snuff out our lives and those of our loved ones? What influences weaken our social fabric and threaten our continuity as a nation? What destroyed former civilizations, the Roman Empire for example? Was it their enemies, the Visigoths, or malaria, or was it the luxury of their over-indulgent way of living? What ages an individual? What ages a civilization? Cultures of man, like cultures and eras of nations, rise, thrive and fall. Why do human tissues wear out? There have been many theories concerning how things grow old. There is painful evidence all around us that age may wither and dry up an individual physically and mentally. Also, there is opposite and stimulating evidence that other individuals seem to grow, ripen and deepen with passing time. There is the shrivelled soul who curses the fates that age him; there is the benign gracious patriarch who glories in the high privilege of enjoying long life. The personal factor, the point of view, the enjoyment of the zest of living has much to do with how a person ages. The same may be offered concerning the flowering of nations.

In these tormented times when leaders of nations are promoting international antagonism, the very survival of our nation will depend on wise and mature statesmanship. A strong and healthy citizenship is of equal importance, for if darkness again comes upon us the ability to come through will be determined by the ruggedness and vitality of our national population. Numerous surveys have revealed the softness and poor physical condition of much of the youth of the nation. Yet we have the highest per capita consumption in food stuffs of any nation in the world. We have the greatest per capita wealth, the largest number of automobiles and gadgets of all kinds. In times of great national peril it behooves the wise leaders of the various groups and organizations which make up our social structure to analyze their duties and obligations to the nation.

THE ADDED DIMENSION

Since the turn of the century, science has completely transformed the world in which we live. With a declining death rate there has been a spectacular gain in life expectancy at all ages. It is becoming more difficult to die. In the last fifty years there has been a mortality decline of 46 per cent (1). Gains are appearing at an accelerated rate; and this explosive prosperity in added years promises even greater gains in the not too distant future. Research and new knowledge reinforce this statement.

Accordingly, an exciting new dimension is being added to human existence. This is available only in regions where an enlightened health program is widely practiced. The challenge to modern medical science is to extend the knowledge and practice of modern health methods to the large continents, which areas contain such a huge proportion of the world's population

In the United States, while the population has doubled in the past half century, there has been a fourfold increase in those over 60 years of age. The largest

portion of medical practice, now and in the future, will be concerned with the health and fitness of our aging population.

The four most common disorders of the later years are cardiovascular breakdown, cancer, arthritis and diseases of the nervous system.

The four basic tissues in which alterations appear with passing time (aging) are the skeleton, muscles, arteries and nerves. These changes are being subjected to intensive research with hopeful results. In the study of these tissues, nutrition and exercise have yielded the most significant information.

Since no basic norms have been established, especially at the clinical level, estimation of health and fitness, for the present, may be guided by a physical examination, body weight, simple tests, an electrocardiogram, and blood and urine chemistry. Roentgenograms readily reveal the presence or absence of osteoporosis.

In discussing fitness, criteria should be set in accord with age and normal activity. Excessive muscle power is not a particular essential for older citizens.

There are certain basic needs of human beings as they progress along life's pathway. A well balanced diet, with avoidance of over-indulgence, should be required as the first basic necessity. It is now becoming evident that exercise is the master conditioner for the healthy, and the major therapy for the ill. Physical and mental fitness implies a dynamic homeostasis. It means the ability of an individual at any age to respond to life's physical, emotional and social on-going demands.

EXPLORING THE NATURE OF AGING

Aging of the individual and his social fabric has now become of first importance. New precision techniques have only recently been developed to examine the various changes that occur in tissues and bodies with passing time. In sum, these changes are the basic biological facts of aging from which all subsequent elaborations derive.

The French mathematician René Descartes observed, "If ever the human race is to advance biologically, intellectually and socially, the science of Biology will perform that service" (2). Since medicine is applied biology, its primacy of obligation and opportunity is apparent.

The time factor is central in the study of aging. There is also a rhythm, a beautiful and dynamic harmony in the procedures which govern living functions and on which life depends. The longitudinal time factor, clock time, is an easy determinant to measure. The qualitative time factor, that is, biological time, is more significant and, also, more complex to encompass. For there are seemingly opposing processes going on at the same time in all cells and organs. There is creation and recession. Nature builds on a plan, with opportunities for deviation. This is the basis of evolution.

If, within us, each day a part of us dies, there is also a rebuilding, recharging mechanism at work. There is a definite progression, the essence of living, growth, development, maturation and recession in every tissue. These processes are now accessible as never before for scientists to measure their extent, content, direction and correlation.

DUAL PROCESSES

The dual nature of alterations which constitute the phenomena of aging is so evident as to seem inconsequential. Yet the emphasis on decline of the individual from atrophy, degeneration and disuse and their social consequences is the underlying basis for the vast amount of deterioration of many elderly citizens. Society and government are in a great quandary. What shall be done with, and for, this huge human waste? The substantial increase in numbers of older citizens has emphasized the necessity for promoting practices designed to keep these oldsters in good health and active participation in the workaday world.

As emphasized by Nathan Shock (3), problems of growth, development and maturing are a basic part of aging, as are deterioration and decline.

Experimental studies with animals have demonstrated the value of diet and exercise in prolonging their lives. Furthermore, in Clive McCay's colonies the animals kept their alertness and potency almost twice as long as the controls (4).

Extensive studies are now in process in many laboratories concerning physical fitness of humans of various ages. These have an especial timeliness because of the explorations in outer space. Such investigations indicate the value of conditioning by exercise plus motivation as fundamental essentials for healthy living. Kaare Rodahl and Steven Horvath and their associates in The Lankenau Hospital have been testing groups of healthy persons of various age groups. Their criteria are based on the oxygen consumption, lactic acid accumulation in the blood, electrocardiogram and pulse rate while the individual is performing at maximum on the bicycle ergometer. Age is but one of the variables in these studies. The practical importance of these observations is revealed in the surprising excellence of performance ability in numerous persons of so-called advanced years.

In one series of studies Rodahl noted the superior ability of a number of older men who were members of a Y.M.C.A. Health Club. They played hand ball and table tennis, and used resistance apparatus and calisthenics. The camaraderie and fun which these older men enjoyed in their exercise routine was an important sustaining influence which contributed to high morale.

When a group of young doctors were tested, using the same procedures, the older men demonstrated their superior stamina. In general, however, young persons who are physically fit can out-perform elderly persons. This fact does not invalidate the use of exercise as an aid in attaining an acceptable state of well-being, regardless of age. Indeed, it suggests the fallacy of presuming a diminished fitness solely as the result of advancing years. Osteoporosis and flabby muscles with a poor circulatory response in older persons indicate a lack of interest and appreciation of exercise as a factor in the maintenance of health. The prescription of activity, when possible, for all elderly patients in hospitals proves the importance that staff members place on maintaining good body tone.

The elaborate services now available through medical science for the treatment of acute emergencies, long-term illnesses and the innumerable nuisance complaints is the explanation for the substantial reduction in mortality statistics. More concern for the maintenance of a better degree of physical and mental

fitness would reduce the illness rate and thereby lessen the need for many of the restorative services now available. Recognition of this fact is shown in the importance pediatricians are placing on child health and development. Maternal and dental practices utilize the same principle. Wider recognition of the possibility of preventing many medical conditions by adhering to a well balanced regimen of diet, exercise, rest and recreation is now essential. It is a curious paradox that only the ill or injured engage the services of the medical profession. In fact, high importance is placed on more services for more sick people and no mention is made of the possibility of reducing the vast amount of avoidable illnesses. A highly publicized, nation-wide educational program, placing at least as much emphasis on positive health, physical fitness and avoidance of disease as is now devoted to medical repair, would greatly reduce the drain on the nation's resources.

POSITIVE INTANGIBLES

Some thirty years ago, in a book called "The Wisdom of the Body," physiologist Walter B. Cannon (5) called attention to the amazing resources present in every human being. These natural endowments include abundant reserves in the heart, liver, kidneys, nervous system and brain. The body possesses a wisdom all its own which, if nourished and cared for, will guarantee a long and abundant life. The emotional glow and the happiness of living which the talented Rabbi Liebman talked about can be carried well into old age, and serve as an effective antidote against the weariness and boredom that are sometimes associated with the higher years. There are intangibles which can never be reduced to mathematical formulas, yet which color existence and weight the scales on the positive side.

Health is to be judged more by quality of life than by length of days. We should emphasize the unity of body and mind and regard health as the root of the word, which, in its highest sense, means "holy." There are primary diseases of the body, as well as of the mind and spirit. In order to minister to the person suffering from a long-term illness which depletes resources and which threatens his very existence, an understanding of the complete individual is necessary. Therapy must include replenishment of all the protective adjuncts that are available.

Modern science recognizes a hate hormone and the physical effects of fear and despair. These emotions bring a definite change in the chemistry of the body. But, on the positive side, this chemistry of despair may be changed to that of hope and enthusiasm. The hate hormone can be neutralized by the new vitamins of faith, kindliness, and a cheerful heart. Doctors know that people with a long-term illness often seem to die by degrees and, if something is lost each day, something may be also gained that will throw the balance in the patient's favor.

Some years ago in a stimulating, and at times irritating, book entitled "Apes, Men and Morons," anthropologist Earnest A. Hooton made the comment that

it is a very short-visioned medical science which works backward from the autopsy table, rather than forward from the cradle (6). He sees no bright future for scientific achievement in the Healing Art by limiting its responsibility to repair work and curative procedures.

There is something intensely personal about illness. The practitioner, faced with a serious emergency, must ofttimes act immediately in the best way he can in an endeavor to save a life. His work is constantly required to relieve the suffering. At the opposite end of the health spectrum, the investigator is not under the compulsion to act immediately. By the very nature of his career, slow and deliberate action provides him with a larger opportunity for accomplishment. Nevertheless, the distance between the opposite poles of the health spectrum dealing with biological and human disease and deterioration should not be so great as to isolate one from the other, for mutual benefit will result when the research worker has a clearer appreciation of the complexity of the problems which the practitioner is called upon to solve.

In its finer essence, the practice of medicine is becoming broader. For the doctor of today has at his command an array of diagnostic procedures and therapeutic instruments which gives him a larger control over the illnesses, traumas and tumors which are man's daily curse. The substantial advances in knowledge in the last decade have spectacularly changed the nature of medical practice and training. The profession is entering a new era with fabulous potentials for bringing about a healthier way of living and a more abundant life for society. To make this a reality requires daring but resourceful leadership from the medical profession all through its ranks, from the research worker to the teacher, to the practitioner, to the administrator and the various specialists. We now know how to avoid many diseases and deteriorations. This knowledge is not being widely applied. Research is far in advance of practice and this will continue to be the case. The fascinating problem of human aging, which has now become so important, is extending the horizons of medical practice. Because of the larger fund of knowledge, the medical profession is now able to make its influence felt by promoting a greater interest in positive health. By emphasizing the basic need of a well balanced diet, adequate exercise, recreation and other simple measures to maintain physical and mental equilibrium, a vast amount of needless suffering can be avoided.

CLINICAL ANTHROPOLOGY

Medical science, a branch of biology, is now enlarging its sphere of exploration to include the study of normal individuals of varying ages under varying controlled conditions. This field is so recent that no normal values have been verified. Yet the discovery that much more information is necessary if man is to live a more adequate and more satisfying life is, in itself, a step forward. Is this within the sphere of medical practice? Some years ago the Dean of Harvard Medical School wrote a challenging article "Medical Education in Transition" (7). His appraisal included reference to the need for training in anthropology and sociology. Such a recommendation goes far beyond present instruction of medical

students. The dominant trend in medicine today is in the direction of increasing specialization, and highly trained specialists are so intense in their techniques and triumphs that no time remains for even passing attention to the broad, underlying ground swell in evolution which is spawning a new and possibly more superior human being.

Should this result in the appearance of a new kind of specialist—not a geriatrician but, perhaps, a clinical medical anthropologist?

The present vast amount of knowledge becoming evident to man and his future is not being made available to the public at large. Where does the obligation and responsibility for working in this field reside? If it does not fall to the doctor, who, other than he, is qualified?

Researches are now in process for the evaluation of human stamina with especial demands for space travel. Such data will be exceedingly helpful as man travels further on his extended life span. His horizons are broadening. The potentials of a more exciting way of life, more meaningful in terms of the grandeur, are only now being discovered. This new approach will not appeal to many of the medical specialists, but a significant number are now joining in a common search for concepts and procedures which will reveal a new and more healthy, more rugged type of human being.

The medical anthropologist may appear as the geriatrician of the future. He will specialize in keeping people healthy and protecting them whenever possible against the inroads of disease, deterioration and decay.

Cultural anthropology directs attention to social customs and attitudes that will enhance well being and enlarge and deepen the well springs of human experience. In these tormented times, when science has uncovered so many amazing facts touching on the positive development of healthier human beings, it would seem that top priority should be given to the classification and distribution of this information through education.

In a classic essay on "The Future of Man," Julian Huxley (8) noted that man has now entered a new phase of evolution, the psychosocial phase. In this phase there are fabulous potentials. Huxley states that man should now realize the fact that he is the master of his own destiny. This will necessitate radical re-thinking of current systems of education and training techniques. The vast numbers of unhappy, insecure, older citizens, uncertain of the future in this nuclear space age, demand wise and considered leadership of the highest quality. Short-cuts to a more satisfying life do not exist. Only by objective analysis of the major issues involved in living longer can the obstacles to their solution be eliminated.

The American Geriatrics Society is in a unique position. With a membership approaching 8,000 physicians, it may perform a combination of services that will result in a more healthy, more abundant existence for our maturing, aging citizens. This should be our goal; may we dedicate ourselves to its attainment.

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PANEL DISCUSSION ON PROBLEMS OF THE AGED IN INDUSTRY*

Moderator: GEORGE C. DOWD, M.D., Chairman, National Industrial Advisory Committee, American Geriatrics Society; Worcester, Massachusetts.

Panelists: HAROLD BRANDALEONE, M.D., Assistant Clinical Professor of Medicine, New York University College of Medicine; Associate Visiting Physician, Bellevue Hospital; Associate Visiting Physician, University Hospital; Medical Director, The Lionel Corporation, New York, N. Y.

WILLIAM P. ECKES, M.D., F.A.C.S., F.I.C.S., Executive Director, Medical Department, Consolidated Edison Company of New York, New York, N. Y.

DAVID H. GOLDSTEIN, M.D., Medical Director, The New York Times, Professor of Industrial Medicine, New York University-Bellevue Medical Center, New York, N. Y.

MODERATOR DOWD: The problem of the older worker in the American economy has become increasingly acute. Why do we have a problem? I should like to mention population trends and certain other facets of the situation.

In 1911, the life span for males was 46 years; for females, it was 48 years. Today, a male can expect to live until age 67 and a female until age 73. In 1900, there were 3,000,000 persons over the age of 65. Today, there are 15,000,000. By 1975, according to the Census Bureau, 20,000,000 are expected to be more than age 65. Since 1900, the rate of increase in the number of older people has been twice that of the general population. This greatly increased life span has been made possible by the tremendous progress achieved by medical science in the conquest of infectious and nutritional diseases.

During this era of increasing numbers of oldsters, the national economy has shifted rapidly from a rural to an urbanized industrial society without regard for the problems of these older people. The security and self-sufficiency of rural life are gone. The old person must depend upon his employer, the Government, the union, or other agencies for social and economic support. Forced retirement because of age alone sharply reduces his income.

In the Rhode Island study on unemployed workers, 59 per cent of males received less than $1,000 per year; 80 per cent of females received less than $1,000 per year. As a consequence of insufficient funds from Social Security or a pension, the oldster must lower his standard of living or seek assistance from children, relatives, or community public assistance funds.

Less than half of our senior citizens 65 years of age or over are employed, and 3.8 billion dollars a year is lost by their nonproductivity. Old Age Assistance pays out more than 1.5 billion dollars to the 2,700,000 people past age 65. In addition, Social Security pays out some 8 billion dollars to 8,000,000 beneficiaries.

As the proportion of old people inordinately increases, the burden will be borne by increasingly small decrements of population. Today, 7 workers support the oldster over age 65. It has been estimated that, in fifteen or twenty years,

* Presented at the 16th Annual Meeting, The American Geriatrics Society, Atlantic City, June 4 and 5, 1959.

5 or 6 workers will support him. As a consequence, we are faced with the problem of what to do with the oldster.

Twenty-five per cent of all voters are past 60 years of age. If nothing is done to resolve their problem, they can exert a powerful and an effective pressure block in legislating their economic security.

Why do we have this problem? We have it because of the tremendous increase in the population of persons over age 65. We also have it because through the years, based upon criteria set up shortly after the turn of the century, 60 or 65 has been established as an arbitrary age of retirement.

Medical science has made tremendous progress in this field. The socio-economic follow-up to medical progress has lagged. The standards are antiquated in view of the work performance of the elderly. The source of this increased longevity has been the medical profession. The medical profession, and particularly the physician who is interested in old-age diseases, the geriatrician, must play a vital role in the solution of this problem.

Some progressive industries and organizations have done something about this matter. It is most important that the physician be acquainted with that which can be accomplished.

Our first speaker is the Associate Clinical Professor of Preventive Medicine, Public Health, and Industrial Hygiene at New York University Medical College and the Executive Director of the Medical Department of Consolidated Edison Company of New York. This progressive and enlightened organization has pioneered in furthering the concept of flexible retirement. Dr. William P. Eckes.

DR. ECKES: One hundred years ago, there was no age problem in industry. The birth rate was high. Life expectancy was low. Today, the situation is reversed. In 1850, only 1 person out of every 38 reached the age of 65. Now, the ratio is approximately 1 in 10. It is estimated that each day more than 2,500 Americans reach the age of 65. The rate of progression will be tremendous by 1975.

At Consolidated Edison, we have what we call longevity of service. The average age of our female employees is 40.8 years; that of our male employees is 46.9 years. We have an active roll in excess of 25,000 employees. Of this number, 14,858 (59 per cent) have twenty-five years or more of service. There is a saying that you are not considered a regular employee in our company until you have been around for twenty-five years.

Among the active employees, more than 3,100 are between the ages of 60 and 65 years—12 per cent of the total. The stated retirement age in our company is still 65 years. This, however, has been modified in the past five years so that, upon department recommendation, men may be retained until age 68 and women until age 65. We in medical and personnel management are of the opinion that retirement should be on an individual basis and not mandatory at age 65. The employee's capabilities, his physical and mental status, his productive capacity, and his attendance record for the prior few years should be evaluated

carefully. The decision to retain or to retire cannot be that of any one person in a department, because pressure will be brought to bear that he cannot overcome. In our company, the decision to retain or retire at age 65 is decided by a panel consisting of representatives of the executive management, the personnel department and the industrial relations department, as well as a medical administrative physician and a supervisory representative from the employee's department. The final decision is based upon a complete report of the employee's health status by the company's Medical Department, a report of the employee's work efficiency based on his rating for the preceding three years, and his attendance record. This applies only to people who want to remain after age 65.

It is interesting that, in 1958, a total of 560 men and women in our organization had the option of continuing to work after age 65. Among them, 353 chose to retire at the stated age. Thirty-five to 40 per cent of the remaining 207 were not considered eligible physically to continue another three years.

In the past few years, 40 per cent of all retirements in our organization were due to physical disability prior to age 65. Among these disabilities, 65 per cent were for cardiovascular disease, 10 per cent each for metabolic diseases and diseases of the bones and joints, 5 per cent for emotional and mental illness and diseases of the lungs and bronchi, 3 per cent for diseases of the central nervous system, and 1 per cent for diseases of the blood-forming organs.

In general, the older worker has fewer absences. It is true that an older worker cannot perform certain jobs efficiently. However, because of his long job experience he has acquired special skills and know-how. He, therefore, performs these jobs better than a less experienced worker. We have among our active employees, 1,721 upon whom our Medical Department has found it necessary to impose one or more permanent work restrictions because of physical defects. Of the 1,721 so restricted, 670 are between the ages of 60 and 65 years. Therefore, 33.7 per cent of all limited-duty employees in our organization are in the age group of 60 to 65 years.

The jobs for physical and clerical workers are diverse. Many jobs require strenuous effort, and demand the agility and physical stamina that only younger men possess. Obviously, oldsters cannot qualify. However, they can perform other lighter jobs efficiently. If such a job is available, it is offered to the older person. However, no employee who has a limited-duty job is retained after age 65. Many of these men have been carried in the limited-duty category for perhaps five years preceding age 65. In other words, they have been overpaid in a job with a lower rating; however, they have not been rated in a lower category because they had twenty-five years of service. By the terms of our union agreement, their rate of pay cannot be reduced no matter how low their rating is in the job they are doing.

The Medical Department does not try to tell the employing department the kind of work that should be assigned to a person. We have a standard list of physical restrictions. The department supervisors decide from the restrictions imposed whether or not these restrictions interfere with the performance of the employee's job title. If so, is there other work within the department that the

employee can perform? If he cannot perform other useful work in his department, he is referred to the Personnel Department for work reassignment.

The list of standard physical restrictions established by the Medical Department is of tremendous help. It enables all Medical Department physicians to impose the same restrictions, which are specific and facilitate assignment of the type of work an employee may do without danger to himself or his fellow employees. Each letter of the alphabet is used to indicate a certain restriction. For instance, "A" indicates that the employee should not be required to lift, push or pull over 15 pounds; "C," that he perform no work requiring repeated climbing of stairs or a ladder; and "H," that he perform no work involving the safety of others. We reserve "Z" for special restrictions that we cannot cover by the standard requirements, for example, not to work alone, or no individual responsibility.

On each visit to the Medical Department, the employee is given a copy of the medical report form to take back to his own department. This gives no information other than the employee's duty status. The standard restrictions are printed on the reverse side of this copy. It is the responsibility of the supervisor to decide whether or not any imposed restriction will interfere with the full performance of an employee's job.

At Consolidated Edison, we do not claim to have solved the problem in connection with employing the older worker. However, by means of our system—careful medical examination, supervision through the cooperation of the Personnel Department and selected job placement—our company has long been in the vanguard in retaining the physically handicapped and the older worker in gainful employment. We have assisted these people in maintaining self-respect by continuing their earning capacity, and have gained the advantage of their long years of experience with us.

MODERATOR DOWD: Our second speaker has had a great deal of experience with the problem of matching physical fitness with job requirements. He is particularly adept in the transportation field, with The Surface Transit Company and The United Parcel Service in New York City. Dr. Harold Brandaleone.

DR. BRANDALEONE: Medical progress has materially increased the life span of man. As a result, retirement at age 65 years is outmoded. Since people are living longer, the care of the older patient presents new medical and social problems. For this reason, the American Geriatrics Society, the Government, and other agencies such as the American Medical Association are studying the problems of the aged.

Many persons between 80 and 90 years of age are doing well in full-time jobs. Labor and industry have been asked to re-evaluate retirement procedures because persons past age 65 have been able to produce outstanding achievements. Peterson conducted a study based on an opinion survey of supervisors of more than 300 elderly employees. This study indicated that the majority of workers past the age of 60 were considered to be as good as, or superior to, the average young worker with reference to absenteeism, dependability, judgment, work quality, work volume, and human relations.

Weaver's experience indicated that the handicapped worker, regardless of age, is fully productive in a suitable job assignment. This author points out that 66 elderly handicapped employees in suitable assignments produced 390 man years of productive work. If employment of these elderly workers had been terminated, it would have cost the company $500,000 in disability benefits from the onset of the disability until January 1956.

Committees to study aging are being appointed by many medical groups for the purpose of collecting careful records and statistics to demonstrate the usefulness of the older worker. There is no question but that the older worker with years of experience, a sense of responsibility, and loyalty to his company is a valuable and useful employee in any industrial environment.

Since our topic is "Problems of the Aged in Industry," I shall not discuss further the usefulness of the older employee, but present the problems that arise in industry.

The basic requirement for the older employee is to maintain physical and mental health. This can be accomplished best by periodic examinations and consultation with his family physician and the company physician. In this way, he is observed by physicians who are familiar with his environment both at home and on the job. The close cooperation and understanding of the family and the industrial physician are necessary. This method of observation will help to detect pathologic changes early and permit prompt and proper therapy which will assist in maintaining the employee on his job.

Mental health is just as important as physical health, especially to the older worker. For this reason, a medical program must be prepared to furnish adequate health counselling and advice. In organizations where strict retirement limitations are enforced, the employee must be properly prepared many years in advance.

In my own experience in industry, the aged worker has been at a disadvantage. I have been associated with a large urban transportation system and a large delivery service handling parcels up to and over 70 pounds. The older worker may be at a disadvantage in such a job as compared with his situation in an industry that does not require such physical effort. It is easy to permit an older worker to work at a bench or a desk, but that same person would not be suitable for carrying a 70-pound package up four flights of steps.

Let us discuss first the problems in the transportation industry. The great loss of life and the numerous injuries resulting from motor vehicle accidents are well known. Last year, there were approximately 38,000 deaths and 1,400,000 injuries as the result of motor vehicle accidents.

In persons 45 years of age or older, heart disease is the greatest cause of death; cancer is second. In this age group, accidents are the third greatest cause of death, and motor vehicle accidents account for 42 per cent of all accidents. These facts indicate that motor vehicle accidents are a serious public health problem. Physicians, unfortunately, do not realize the importance of their role in preventing these accidents. Physicians can reduce motor vehicle accidents by performing periodic examinations of all persons past the age of 45. They must convince persons who are not capable of driving to discontinue driving.

In industry, the task of preventing a disabled employee from driving is easier than it is in private practice. The three major factors in motor vehicle accidents are the road, the vehicle, and the driver. The driver is the most important. For this reason, the physician must become aware of the significance of the physical and mental health of the operator of the vehicle (bus, taxi, trolley car or airplane), or of anyone else who has responsibility for the safety of the public.

The physician must realize that the requirements for drivers of transportation vehicles, commercial vehicles and private vehicles are different. He must realize that the following three factors have to be considered in determining the ability of the older employee to drive with safety: 1) organic disease, 2) emotional or psychologic disturbances, and 3) drugs. In order to determine these factors, frequent examination must be made of the older person. Recently, the following two papers were published to assist the physician in determining the suitability of his patient to drive a motor vehicle with safety: 1) Recommendations for medical standards for motor vehicle drivers, in the January 1957 issue of *Industrial Medicine and Surgery*, by the Committee on Standards for Motor Vehicle Drivers of the Industrial Medical Association. 2) A medical guide for physicians in determining fitness to drive a motor vehicle in the March 14, 1959 issue of the *Journal of the American Medical Association*, by the A.M.A. Committee on Medical Aspects of Automobile Injuries and Death.

Organic disease. Employees with the following types of disease must be relieved of their jobs as drivers: 1) diabetes requiring insulin, and 2) cardiac or cardiovascular conditions that might suddenly incapacitate him, such as severe coronary artery disease, arteriosclerosis with auricular fibrillation, Stokes-Adams syndrome, carotid sinus sensitivity, hypertension with complications involving the kidney or the retinal vessels, and cerebral arteriosclerosis.

The driver with impaired vision that cannot be corrected should not be permitted to drive. The impaired vision may be due to diminished visual acuity, reduced visual fields, muscle imbalance, or some other disease of the eye. A person with a neurologic disorder causing convulsions, regardless of etiology, should not be permitted to drive. The same applies to a patient suffering from Ménière's disease or any other condition that might cause dizziness, or to a person with a neurologic condition such as severe Parkinson's disease.

Fatigue is also important as a cause of accidents, particularly in the older person. The physician should evaluate fatigue carefully before deciding whether his patient can drive with safety.

These are only a few of the more important disabilities relating to drivers. A detailed discussion can be found in the references quoted.

Emotional or psychologic factors. Any employee, particularly an older one, with neurotic or psychotic illness, should not be permitted to drive a motor vehicle. We are all aware of the emotional changes that occur in the older person. They resent their inability to accomplish things as well as they did in the past. Various depressions and paranoid reactions may cause them to convert their hostilities while they are driving.

Drugs. Most physicians do not think about the relationship of motor vehicle accidents to the use of drugs. When they prescribe for their patients they do not

realize that they should advise the patients to determine the effects of any new medication before they drive. Central nervous system depressants, hypnotics, sedatives and tranquilizing agents can cause severe depression. Therefore, such medication should not be taken while driving until the person has first determined whether or not it has a bad effect on his reactions. Antihistamines and drugs for the treatment of motion sickness may cause drowsiness and thus may be dangerous to take while driving. Certain drugs used as stimulants to the central nervous system provide only temporary relief, and then may cause excessive fatigue that interferes with safe driving.

Alcohol is one of the most frequent causes of motor vehicle accidents. Frequently, even two drinks may cause the concentration of blood alcohol to rise above a level that is safe for driving. The dangers must be emphasized for anyone who drinks. Alcohol and driving do not mix.

Comment. The problems of the older operator of a commercial vehicle are even more complicated than those of the transportation driver. In addition to driving, he must perform strenuous duties. In this group of employees, the factors mentioned previously are disabling, and further factors must be considered. For example, the driver of a commercial vehicle must have the physical stamina to lift or carry heavy packages or do the other extra work that is required. Cardiac capacity may be adequate for driving but not good enough for such efforts as lifting heavy furniture.

The older driver is particularly liable to contract some illness that could prevent him from working, so he must be evaluated carefully at regular intervals.

In our experience, these problems have been handled in the following way. Careful periodic physical examinations have been made of all employees, especially those past age 50 years. Prompt corrections of all defects have been made, when possible; when impossible, and the disease has prevented the employee from performing his usual work, the following alternatives have been utilized: (a) Change to a job the employee is capable of performing, if such work is available. In many industries, there are only a few jobs suitable for sick or ailing aged employees, for example, cleaner, fueler, mechanic, store clerk, checker, or watchman. Union seniority frequently prevents an employee from transferring from one department to another. In some instances both labor and management may make proper job placement of the sick or aged employee difficult or impossible. (b) When a change in job is impossible, substitute retirement or severance with pay. This can be readily accomplished in companies with good severance or retirement plans. Employees frequently find suitable occupations after retirement to keep them mentally busy. When retirement or severance is not possible, aged sick employees may have to leave their jobs and give up their seniority because they are unable to do their regular work, and there is no work available that they are capable of performing.

Summary. In most industries, the aged employee may continue to be useful even when he is disabled. However, in certain industries, public safety is a factor. In others, the physical requirements are too great for the older employee, and he must either find other work in his company, retire, or resign.

The physician has an important role in the prevention of motor vehicle accidents. Since organic and psychologic disturbances and the effect of drug therapy are factors that might disable a motor vehicle operator, they must not be overlooked.

MODERATOR DOWD: It is my pleasant privilege now to introduce our final speaker, Dr. David H. Goldstein, President of the New York State Society of Industrial Medicine.

DR. GOLDSTEIN: I have jettisoned part of my talk to avoid repetition. I am going to speak *ad lib.* for a short while.

My remarks are predicated largely on my experience as Medical Director of the *New York Times*. We have over 5,000 employees with a population age distribution much like that at Consolidated Edison. The average age of the males is about 48 years.

We, too, have a significant and growing share of senior citizens. I have been with the company for fourteen years, and am just beginning to emerge from the youngster stage, at least in the eyes of my senior colleagues.

There are a number of unions among our 5,000 employees, about half of whom are in craft unions, and half in the new type of guilds. The latter are essentially the white collar workers of the circulation, business and advertising departments, reporters, and the editorial staff. The guild members work under a policy of mandatory retirement at age 75. During the next ten years, this will be reduced to age 70 and stop at that point.

The craft unions, by contrast, recognize no automatic or mandatory retirement age. The matter of retirement of senior citizens in the craft unions is by virtue of total disability, voluntary retirement after age 65, or, as their age advances towards 80, encouragement by us to retire. The encouragement has to take the form of some tangible inducement in terms of a worthwhile retirement formula. Such a formula is perhaps the most important motivation in retirement, apart from the other factors of education which I shall discuss.

Our retirement formulae approach a level of 50 per cent of the working wage at the time of retirement, provided there has been sufficient service to the company by the employee. When there is a significant and worthwhile program, retirement, as a rule, is not a problem.

My thesis is to discuss the role of the physician in industry in counselling and preparing employees for retirement. I am referring to the role of the physician in the area of health, reserving for the Personnel Department the economics of retirement.

Physicians in industry, and in private practice as well, have lagged in their responsibility to counsel older patients relative to retirement. In a way, all of us are guilty of the emotional device of projection. The physician infrequently plans for his own retirement, and even less frequently does he retire. Unconciously, we project our own pattern of "dying with our work-boots on" upon our patients.

Based upon observations of senior employees over the past fourteen years, it appears that their attitudes toward retirement, as they reach the sixth decade,

fall roughly into three groups: 1) the majority worry about and fear retirement, 2) a minority repress the idea or exhibit ambivalence, and 3) an even smaller minority plan enthusiastically for their retirement.

Most studies have shown that a good adjustment to retirement is more likely to occur when retirement has been anticipated and planned. Here, the physician can make a tangible contribution. Let us not be fooled by the patient who says, "When I retire I shall participate in community activities and do all the things I have never found time to do." Experience has demonstrated that activities not participated in before retirement are rarely initiated afterward.

It is evident, then, that pre-retirement resources must be harnessed well in advance of retirement. Most important in counselling is an understanding of the meaning of work to employees. If one but recalls the products of Madison Avenue's efforts in advertising, be it concerned with soft drinks or automobiles, it becomes evident that in our society overemphasis is placed on speed and youth. This spills over into all phases of our culture, including our industrial life. By implication, it constitutes a deprecation of older age. Consequently, old age is looked upon almost symbolically as a period of life characterized by poor health, economic insecurity, loneliness, resistance to change, and failing mental powers. This concept is what must be overcome in counselling candidates for retirement, because it need not be so.

Moreover, for many workers the job is principally a way of relating to society and of participating in a social group. Work is more than earning a living; it is a way of life. The termination of employment not only implies obsolescence, but represents significant social impoverishment. This applies to the executive as well as to the line worker. Sometimes executives of large corporations almost immediately upon retirement find themselves excluded from the social group which several months previously contained their intimate friends.

Sociologists have pointed out that physiologic deterioration after age 65 is much less important than social deterioration. Positively expressed—those who are able to preserve social integration in their communities after retirement are better able to avoid the decompensation of age. It is evident that for retirement to be successful, it must avoid the pitfall of significant loss in status. The flexibility and the resources of a person largely predetermine his fate upon retirement. In the longest view, preparation for retirement really begins before employment—a development of one's resources beginning in grammar school and in high school. These determine the success of retirement.

Studies conducted by Cornell on retired persons have demonstrated two interesting factors: 1) the fallacy of the common concept that people who retire become ill because of retirement, and 2) the fact that people who become ill early in retirement are those who retire because they are ill, whereas those who retire when they are well usually stay well for a fair period of time.

These studies also have shown that despite the fact that many persons were poorly prepared for retirement and had a difficult time in the early period, they exhibited greater flexibility and adaptability than was thought possible at the time the study was undertaken.

Thus one can have faith in the potential of the retired person to adapt, but by all means he should be helped to use this flexibility and adaptability.

The term "older worker" does not in practice connote a specific age group. Realistically evaluated, a person is an "older worker" when age becomes a handicap to the job by virtue of the manifestations of either the aging process or a complicating chronic disease. Actually, retirement programs and the age limit for automatic and mandatory retirement are determined in large parts by the labor market or the economy, the presence or absence of paternalism, union strength, and the product of all of these as expressed in company policy and negotiated contracts. Unions are taking an active hand in preserving the senior citizen at work.

Members of the American Geriatrics Society need not be told that the aging process and chronic disease do not affect all people alike. There is no chronologic specificity to the phrase "older worker" in terms of physiologic or functional capacity. There are people who are young at age 65 and others who are old at age 55.

With the advent of automation in industry, the preservation of judgment and emotional stability will become more important to a company than physical capacity. We are woefully lacking in satisfactory tests of functional capacity. In industry, in the final analysis, the ability to do the job required is the best available test of capacity or performance.

As to the role of the industrial physician in preparation of persons for retirement, there is a real opportunity to render assistance to the often frightened employee. Through the medium of periodic examination, and examination at the time of return to work following an absence due to illness or injury, the physician can appraise the employee in depth and gently sow the seeds of curiosity and interest in retirement.

The economic aspects of retirement are in the province of the Personnel Department, but the role of the Medical Department becomes a significant responsibility when one realizes that more than half of those who retire do so because of ill health.

No one has a crystal ball, and statistics have a way of refusing application on an individual basis. Nonetheless, as one follows a patient closely in the development, for example, of heart disease, one does not need to be clairvoyant to predict when trouble is likely to occur. Working life can, and frequently has been, lengthened by job adjustment in industry after careful appraisal of both physical capacity and job demand. The need for these adjustments should be a signal to the physician to begin to guide the worker in preparation for retirement. The physician in private practice should do the same. Between half and two-thirds of the labor force works in plants which are not covered by in-plant medical services. Therefore, if the responsibility is not yours, it is nobody's.

What are some of the health-problem areas in which the industrial physician can counsel the older worker? In industry, how can one make the best use of the Medical Department? The Medical Department exists to detect disease early. Its purpose is maintenance of health. Its responsibility is not to treat, but to

refer the patient to the family physician after observation of warning signals regarding health or performance which indicate that something needs to be done. It is a diagnostic center, not a therapy center.

A well-run Medical Department in industry aids and abets the relationship of the patient to the family physician. The constant plea in our company is, "Have you a family physician? Why don't you have a family physician? You should have a family physician." Then we point out why—that certain information has been picked up and that we need to pass it on because something should be done about it. This effect is all wasted if we cannot get a good family doctor-patient relationship as a basis for utilizing this information.

If retired employees move to another area, they frequently are concerned about securing family doctors. A great deal of help can be given by counselling with regard to the use of lists of physicians in the new community, as prepared by the county medical society.

Although mobility in a retired employee is desirable for optimum happiness, experience has shown that only a small percentage of retired employees move from the place where they were living prior to retirement. This reinforces the importance of developing good family doctor-patient relationships before retirement. We consider it a solemn responsibility in industry.

A frequent problem for retiring employees in relation to health is when, how, and where to retire. Most often they stay where they are, but they spend a great deal of time thinking about whether or not they should move, and whether they should move because of their health. Perhaps for peripheral vascular disease a man should go south. Perhaps the man with congestive heart failure or arthritis should not be in a northern climate. These factors greatly concern the pre-retirement worker. You, as family physicians and geriatricians, can be of great value in this field. Often the employee is reluctant to talk about the matter, but if you draw him out you find that he is brooding about it.

Another problem for the doctor is health in relation to a second career. Many employees retire with intentions to take on other work. Some of their plans for post-retirement employment, in view of their limited work capacities, are unrealistic. Such an example is the plan of a man who has had one or two bouts of congestive heart failure, to retire to a farm which he intends to work himself. Employees need counselling in this respect, and you can help them.

Of great concern to candidates for retirement is the economic aspect of health protection after retirement. For the most part, the extent to which people 65 years of age and over have some form of health insurance is directly related to their involvement in the labor market. A 1958 report of the Health Information Foundation indicates that 43 per cent of those 65 years of age and over carry some form of hospital insurance. In addition, the majority of this group carry some form of surgical insurance plus other in-hospital doctor coverage by virtue of group industrial policies. The rate of such insurance coverage for the general population is 65 per cent compared with 43 per cent for those 65 years of age and older. We contemplate that in the years to come, those aged 65 and older will have a higher and higher percentage of insurance coverage, eventually approximating that of the general population.

It should be emphasized that about 40 per cent of males aged 65 years and over are still in the labor market, and when the statistics are limited to that important still-productive age period of 65 to 69 years, the proportion is 62 per cent. At the ages of 70 to 74 years, 39 per cent of this group are still in the labor force; at age 75, the proportion is 20 per cent.

Most industrial group policies, be they with private carriers or with Blue Cross and Blue Shield, allow for conversion to an individual policy at the time of retirement. There is an increasing trend toward company or union financing of medical-care insurance upon retirement, rather than conversion to an individual employee-paid or retired employee-paid policy.

There is some lag, to be sure, in the coverage of dependents. Medical care in retirement is of vital concern to the retired worker and a matter that we physicians must face realistically. If management and unions do not take up the slack, there will be renewed pressure to pass the Forand Bill.

The health problems of the older worker provide a challenge to the medical profession (both inside and outside the industrial plant), which we cannot ignore under penalty of committing professional errors of omission.

MODERATOR DOWD: At this time we open the panel for questions.

Here is a question directed to Dr. Brandaleone: *"What is the percentage of traffic deaths caused by over-sized American cars?"*

DR. BRANDALEONE: I do not know.

MODERATOR DOWD: *"What do insurance companies think about returning the older worker and the physically handicapped worker to the job?"* Dr. Goldstein.

DR. GOLDSTEIN: Studies have shown that, whereas older workers are absent for more serious reasons than are younger workers, they are absent less frequently, and their accident rate is not significantly greater. The cost of their medical care is greater, but the insurance contract implies the dilution due to mixing a bad-risk group with a good-risk group. That is one of the advantages of industrial group insurance; the greater risk in the older population is being balanced by the lesser risk in the younger population. This is an accepted insurance principle. Insurance companies now accept the continued employment of the older worker.

MODERATOR DOWD: *"How is an epileptic best employed, if his fits are controlled?"*

DR. ECKES: By the use of limited duty. We would put certain restrictions on him, and put him in a safe job. For instance, a utility mechanic with twenty-five years or more of service might be given a job as an inter-office messenger, or in the mail service, or in some place where he would be safe. We would take him away from a splicing job, if he were a splicer. We certainly would not let him drive. By a selective system of physical restrictions, we would keep such persons on the job.

MODERATOR DOWD: *"How many of your driver criteria would apply to persons doing non-transit or personal driving?"* Dr. Brandaleone.

DR. BRANDALEONE: There is a long list of criteria. This material has been published in the references I gave.

MODERATOR DOWD: *"What success is being met in approaching industry and labor with regard to relaxing the requirement of mandatory retirement at a certain*

age? Are difficulties from these groups anticipated? If so, how do you propose to overcome them?" Dr. Goldstein.

DR. GOLDSTEIN: Management-labor contracts do not fail to recognize the retirement age. Management has largely determined the retirement age because it has paid the major share of the pension or retirement benefits. In some of the craft unions in which there are union welfare funds or trustee management-union welfare funds and the pension comes from the union although the contribution is from management, unions have taken an active hand in raising the retirement age. It really depends on the particular union and management relationship.

Retirement formulae have changed a great deal in the last ten years. I should like to refer those of you who are interested to an excellent study on the present status of retirement planning issued by the National Industrial Conference Board in 1955. It is entitled "Studies in Personnel Policy 148, Retirement of Employees." It defines the status across the country.

MODERATOR DOWD: *"Is the small current tax-paying generation to pay the increased taxes for these programs?"* Dr. Goldstein.

DR. GOLDSTEIN: For the most part the consumer is at present paying for for retirement formulae, because the cost is added to the price of a product. If, however, industry does not maintain this position and we enter such programs as provided by the Forand legislation, the taxpayer will pay for it. At present, it is carried, except through Social Security, by the consumer.

MODERATOR DOWD: This question is directed to Dr. Brandaleone. *"Many persons are now receiving oral hypoglycemic medication rather than injectable insulin. Do you prevent them from driving?"*

DR. BRANDALEONE: Presumably you refer to preparations like tolbutamide or metahexamide, that are used in the treatment of diabetes. We permit persons taking these oral preparations to drive. Only rarely does a hypoglycemic reaction occur in these persons. Dr. Joslin's clinic reported a patient who was extremely sensitive to the oral preparations and had a temporary bout of dizziness. In general, however, it is safe to allow persons taking oral antidiabetic preparations to drive.

MODERATOR DOWD: *"Do persons who have not planned their retirement become mentally depressed more readily than persons who have?"* Dr. Goldstein.

DR. GOLDSTEIN: That is a good question. The one instance of so-called "retirement shock" that I have seen was in a person who had decided over the last fifteen years of his work life that he was not interested in coming to the Medical Department. He had no private physician relationship. At age 75, even though he knew that there was automatic mandatory retirement at age 75, he plummented into a reactive depression. I have a deep conviction that preparation of the employee for retirement by the physician in the plant and the private practitioner can largely prevent such a reactive depression, or what we call "retirement shock."

MODERATOR DOWD: *"In the interest of self-perpetuation, is there union resistance to raising the retirement age?"*

DR. GOLDSTEIN: Unions are in favor of maintaining their workers in the labor market as long as possible.

MODERATOR DOWD: *"It has been stated that less than half of the people aged 65 or over are employed. Does this apply to males or females? What percentage of males and females aged 50 to 55 are employed?"*

DR. BRANDALEONE: I do not know.

DR. ECKES: I do not know.

MODERATOR DOWD: *"What methods are used in industry to educate the healthy prospective retiree during his last few years of employment for his ultimate retirement into a new way of life?"*

DR. GOLDSTEIN: That is summarized in the study made by the National Industrial Conference Board. In general, the results of their survey are in keeping with my own experience that there is a growing trend in industry to consider it a responsibility to prepare employees for retirement. More than 75 per cent of the industrial concerns solicited have programs for retirement preparation or retirement counselling. Most of them are on an informal basis, in the sense that they invite the employee to come to the Personnel Department. In many instances, they have a tickler file so that at age 50 an automatic invitation calls the employee to the Personnel Department. There are few organized programs in industry keyed to speaking to large groups of persons. I have had some experience, for example, with the programs of the Federal Researve Bank. Once the employees turn out for such organized programs of retirement counselling they are worth while; but the audience does not like to stand up and be counted. There is a native reluctance to say, "I have to face my retirement." More can be accomplished on an individual basis. However, when groups can be brought together, they do well. There is extensive counselling in industry, but mostly on an informal and personal basis.

QUESTION: *Will you give us the address for obtaining the publication you mentioned?*

DR. GOLDSTEIN: Write to the National Industrial Conference Board, Inc., New York City, and ask for Studies in Personnel Policy No. 148 entitled "Retirement of Employees." They will almost certainly charge you for it, but it is well worth it. It is an outstanding study.

MODERATOR DOWD: *"What attempts are being made to shift the elderly healthy employee gradually from a menial to an advisory capacity, thus utilizing the employee's experience and training to the utmost rather than maintaining him in a progressively limited capacity conducive to a feeling of inadequacy?"* Dr. Eckes.

DR. ECKES: There is no feeling of inadequacy in the situation. The people whom I refer to are those who, in an organization not employing our policy, would be let out with a separation allowance. They are put into a job where they are safe to themselves, and to their fellow workers. I do not think that is degrading an employee, if he happens to be so unfortunate as to have some physical defect. It would be more degrading to dismiss him.

QUESTION: *I am referring in the question to the shift of a healthy employee from a menial to a supervisory capacity. Is there a tendency in industry to do this?*

DR. GOLDSTEIN: This happens automatically in industry. As production workers gain seniority, a certain number of them rise to foremen and assistant foremen. However, only a certain number of such employees become thus

qualified, and only a certain number of such jobs are available. Although this advancement happens automatically, supervising jobs cannot be created where they are not needed.

DR. ECKES: That is our experience too. You cannot have an army of generals. You must have a certain number of officers and a certain number of privates. When a vacancy arises for an officer, a qualified person is the one who gets it.

MODERATOR DOWD: This question is from an "unconservative physician." "*We indeed get old, too. How about some advice on when and how to retire?*" Perhaps Dr. Goldstein has some advice to physicians about retiring.

DR. GOLDSTEIN: In medicine, we build our own retirement program by tapering off our activity as we grow older. The second career is a less intensive first career for those of us who are practitioners. Many of us have thought a great deal about retirement, certainly from the economic point of view in terms of having our own annuity program, since there is no company to take care of the practitioner. This in itself is one step towards the financial security of retirement. It is important that physicians give consideration to it.

There has been an increasing interest on the part of physicians to be eligible for O.A.S.I. of the Social Security Law. This law may be extended in the near future to include physicians. I agree that we have not given enough thought to the retirement of physicians.

DR. BRANDALEONE: Dr. Goldstein has summarized the problem very well. In my own experience with colleagues, it is an individual problem based upon the emotional reaction of the physician. Most physicians taper off their work in the later years and develop some type of hobby on which to spend time. On the other hand, I know many physicians who, the older they grow the busier they are. It is an individual problem.

DR. ECKES: I am a little different from these other two men. I started with my organization in 1926 on a six weeks' temporary assignment, and stayed with them part-time until 1944. At that time I seemed to be pretty well played out with the work I was doing, and I said I was going to leave the company. They told me they could not let me do that after all those years; they would bring me inside. From then on, I have been a full-time salaried employee entitled to a pension. That is my answer to this question.

I have been involved, too, with some of the best plans of retirement for the man practicing medicine. I happened to have had in my younger years the benefit of counselling from a wise insurance agent. He persuaded me to take out some annuity insurance. That was about 1929, after the stock market had given me a working over. I brought an amount of annuity insurance which, at this time, should enable me to retire and live well. This I cannot do, however, because of the decreased value of the dollar.

That is the situation with most people who are along in years. It is a difficult problem, because of the high overhead and high taxes. One just cannot elect to retire.

MODERATOR DOWD: "*What is the psychologic effect on a worker who is reassigned to a less significant position in order to keep his earning? Is continued employment in that less significant position worth while?*" Dr. Eckes.

DR. ECKES: We have not encountered any indication to the contrary. These men usually are glad to get the lighter jobs and keep on working, rather than being forced into retirement.

DR. GOLDSTEIN: That has been our experience.

DR. BRANDALEONE: And mine too.

DR. GOLDSTEIN: The problem is to find the lighter jobs in sufficient numbers to meet the demand.

DR. ECKES: The ones I come most in contact with are $145 to $150-per-week mechanics who have been transferred to messenger and mail work after thirty years of employment with us. They are happy in their jobs. They are making all this money pushing around light go-carts.

DR. GOLDSTEIN: This is known as "retirement on the job."

DR. ECKES: They are happy about it.

DR. GOLDSTEIN: A great deal of this is done. Nevertheless, in the case of the person who retires at age 65 the retirement formula would be roughly 50 per cent of his salary. Thus, all he has to do is 50 per cent of his job, and the company is breaking even in terms of return for salary paid.

DR. ECKES: There are many things against this. If the employee should happen to be an executive or foreman, he may hold up a promotion down the line. This leads to a discussion of the pros and cons of selecting a specific age for automatic retirement.

MODERATOR DOWD: "*Will you discuss the Social Security reprimand to post-retirement income?*" This must mean the relationship of Social Security benefits to post-retirement income. Dr. Goldstein.

DR. GOLDSTEIN: This is a point at which I should like to stop, because the physician should confine his activities to the areas of his skills. First, I am not qualified to discuss this question and, second, this is the province of the Personnel Department.

MODERATOR DOWD: Dr. Goldstein has asked me to give you the address of the Conference Board. The New York address is 260 Park Avenue, for those of you who are interested in obtaining the booklet.

DR. GOLDSTEIN: It is a monograph of about eight pages.

MODERATOR DOWD: You have heard an excellent and practical discussion of the work capacity and the retirement potential of the older worker, and your attention has been drawn to the increasing magnitude of the problem. You have become acquainted with some of the yardsticks of evaluation for industrial employment. Evidence has been presented that the concept of the mentally outmoded older worker is disproved by his performance in industry. It has been thought that the older employee is weak and sickly, frequently absent, prone to accidents, slow at his work, and hard to train. In actual practice he is most frequently healthy and active. He has an excellent record so far as absenteeism is concerned. He is dependable, reliable, safety-conscious and trainable. Geriatrically speaking, the oldster is not the decrepit specimen that he is painted to be.

It is gratifying to observe the increasingly wide acceptance of the concept of a flexible retirement age based upon the matching of physical capacity with job requirements.

UNILATERAL DYSPLASIA OF BONE IN AN ELDERLY WOMAN

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The term fibrous dysplasia of bone was first suggested in 1938 by Lichtenstein to describe a disorder of the skeletal system, of unknown etiology, the dominant pathologic characteristics of which are resorption of bone, fibrosis of the marrow connective tissue, and substitution of normal cancellous and cortical bone by poorly formed, disorderly cancellous trabeculae. When the disease is confined to one bone it is described as mono-ostotic. When it is segmental or unilateral in distribution, involving many bones, it is known as polyostotic fibrous dysplasia or osteitis fibrosa cystica disseminata. A commonly observed unilateral grouping involves the ilium, the femoral head and neck, the tibia and the metatarsals.

The bony changes may be remarkably extensive without producing disabling symptoms. The first knowledge the patient may have of the disorder is the occurrence of a pathologic fracture, or a handicap in walking caused by swelling or deformity of an extremity.

Fibrous dysplasia of bone may be classified into three main groups:

Group I is the largest. Only bone tissue is affected. Changes involving many bones are probably more frequent, but Schlumberger has described 67 cases limited to one bone.

Group II consists of fibrous dysplasia associated with cutaneous changes. The skin lesions are areas of brownish pigmentation, and they exhibit the same distribution as the bone lesions.

Group III (Albright's syndrome) has three main features: 1) dysplasia of bone, 2) areas of cutaneous pigmentation, and 3) precocious puberty. The sexual precocity is associated with skeletal and somatic precocity. The syndrome is relatively rare and is confined to females.

In 1946 Jaffe estimated that for every case with the complete picture of skeletal lesions, pigmentation and sexual precocity there were 20 to 30 cases with fibrous dysplasia of the skeletal system alone.

It is not to be inferred from this classification that there is a common etiology for all three groups. Nothing is known of the cause, but unilateral involvement of the skeleton suggests a neurologic or embryologic disorder. In the case presented here, hemiplegia had occurred on the same side as the bone lesions two years prior to admission.

In recent years many cases of polyostotic fibrous dysplasia of bone have been discovered in adults in the course of treatment for other conditions, indicating that the disease may remain dormant for long periods.

As far as we know, in the case presented here the patient is the oldest to be reported as having polyostotic fibrous dysplasia.

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CASE REPORT

On July 17, 1958, a 63-year-old Italian woman was first admitted to Columbus Hospital complaining of pain and stiffness of the left lower extremity with inability to walk.

In 1956 she had a cerebrovascular accident with left hemiplegia. The diagnosis had been made by the family physician. She was told she had high blood pressure, but hospitalization was not advised, and no further details are known. She had apparently made a complete recovery except for residual weakness in the left knee. Prior to this illness she had never suffered from arthritis, deformity or difficulty in locomotion of any kind. She had always been active.

Menstruation started at 14 years of age, and continued regularly. The patient was married at the age of 26. She had 3 pregnancies (2 normal and 1 abortion). The menopause had occurred at age 53.

The family history was noncontributory. Her father and mother were not related. There was no history of bone dyscrasias in the immediate family.

TABLE 1

Laboratory Data

	Hgb (Gm. %)	RBC (per cu. mm.)	WBC (per cu. mm.)	Differential leukocyte count (%)			
				Poly.	Lymph.	Mono.	Eos.
Hemogram							
July 19, 1958	13.2	4,500,000	8000	72	33	3	2

	July 19, 1958	Oct. 20, 1958	Jan. 2, 1959	Feb. 16, 1959
Urine				
Reaction	Acid	Acid	Acid	Acid
Specific gravity	1.020	1.006	1.006	1.008
Albumin	0	1+	trace	trace
WBC	2–3 cells	many	14–20	many
RBC	1–2	8–16	0	3–5
Epith. cells	rare	—	—	—

Sept. 18, 1958—Sulkowitch test—trace of calcium.
Jan. 2, 1959—Sulkowitch test—no calcium.

Blood

July 18, 1958—Fasting blood sugar, 82 mg./100 ml.; urea nitrogen (BUN), 19.9 mg./100 ml.
Aug. 5—BUN, 33.3 mg./100 ml.
Sept. 16—Cholesterol: total, 272 mg./100 ml.; esters, 62%
Oct. 3—Serum chlorides, 100 mEq./liter

	Serum calcium (mg./100 ml.)	Serum phosphorus (mg./100 ml.)	Serum alk. phosp. (Bod. units/100 ml.)	Serum acid phosp. (units/100 ml.)
Aug. 5, 1958	10.4	5.7		
Aug. 8			22.2	
Sept. 16			18.1	0.3
Sept. 19	11.0	4.0		
Oct. 9	12.0	2.8	18.3	0.5
Feb. 16, 1959	10.5	5.7	16.0	0.85

Serology—no syphilis.
Nov. 25, 1958—Blood culture, no growth.

About two months before admission, the patient experienced profound weakness of the left lower extremity with difficulty in walking and standing. At this time the muscles of the left leg felt stiff and she was unable to flex the left knee. All the symptoms progressed, so that on admission she was unable to walk or stand unassisted.

Physical examination. She was a short, well developed and well nourished white woman, not acutely ill, and without cardiac or respiratory distress. She was 5 feet tall and weighed 170 pounds. The blood pressure was 150/80 mm. Hg, temperature 99°F., and respirations 20 per minute. Her head was well formed, with no deformities or irregularities of the facial bones. The pupils were equal and reacted to light and accommodation. The cranial nerves showed no abnormalities. The neck was supple, with no masses or engorged vessels. There was no appreciable adenopathy. The chest was symmetrical and both sides were equal in expansion. The lungs were clear to auscultation, and normal to percussion and palpation. The heart was enlarged to the left, with regular sinus rhythm, $A_2 > P_2$, and a grade 2 systolic murmur at the apex and in the aortic area. (The electrocardiogram indicated ischemia of the anterior wall of the left ventricle.) The abdomen was obese and soft, but no masses were felt. The liver and spleen were not palpable. The left arm was 1 cm. wider than the right, and the left thigh was 2 cm. wider than the right. In the left leg, atrophy of the soft tissues was evident. Vaginal and rectal examinations did not reveal any pathologic conditions. The distribution of pubic hair was normal. No pathologic reflexes were noted. There was no Babinski sign.

The biochemical *laboratory findings* are summarized in Table 1.

Roentgenographic findings. Figures 1–3 show the lesions of fibrous dysplasia in the bones of the arm, leg, pelvis and ribs on the left side but not on the right. Figure 4 shows that the bones of the head were unaffected.

Course in the hospital. The patient was confined to bed and to a wheelchair for about thirteen weeks. Her condition remained the same as on admission, in spite of treatment.

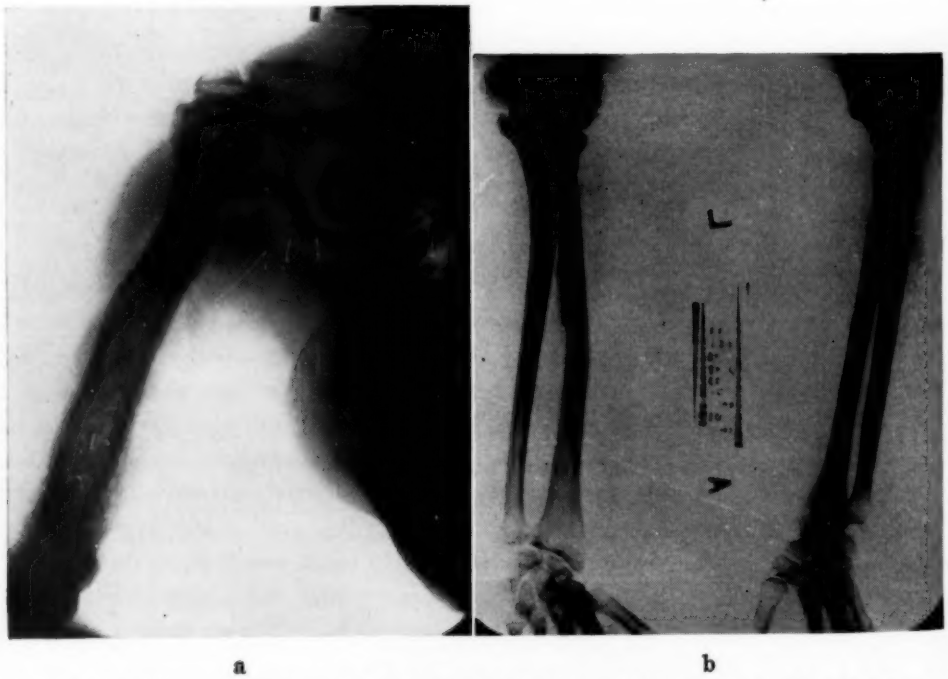

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FIG. 1. a) *Left humerus.* There is moderate widening and thickening with multiple areas of increased density throughout. b.) The proximal half of the *left radius* shows changes compatible with fibrous dysplasia. No such changes in the right radius.

a b c

FIG. 2. a) *Left pelvis*. Accentuation of the trabecular pattern. b) *Left femur*. Widening and cystic changes. c) *Left tibia and fibula*. Changes compatible with fibrous dysplasia. There are no corresponding changes in the bones of the right side.

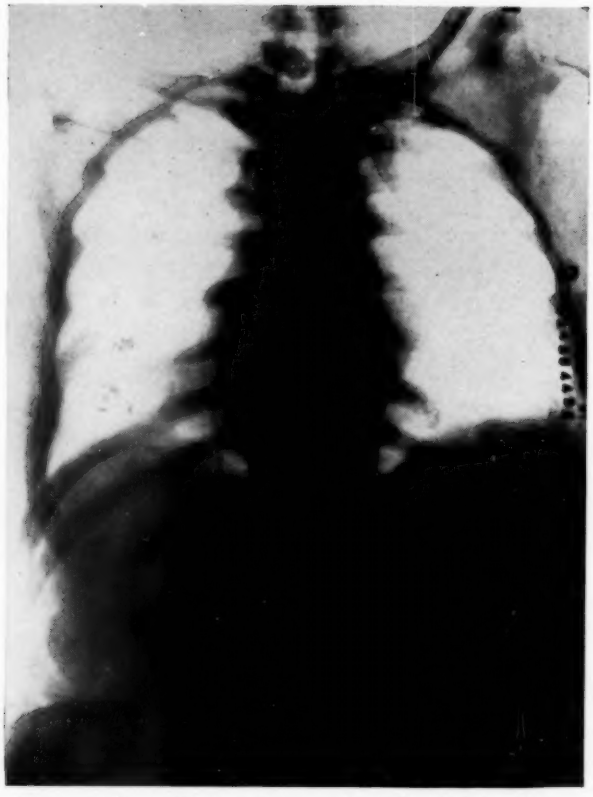

FIG. 3. *Chest.* Cystic changes in left ribs 6 and 7.

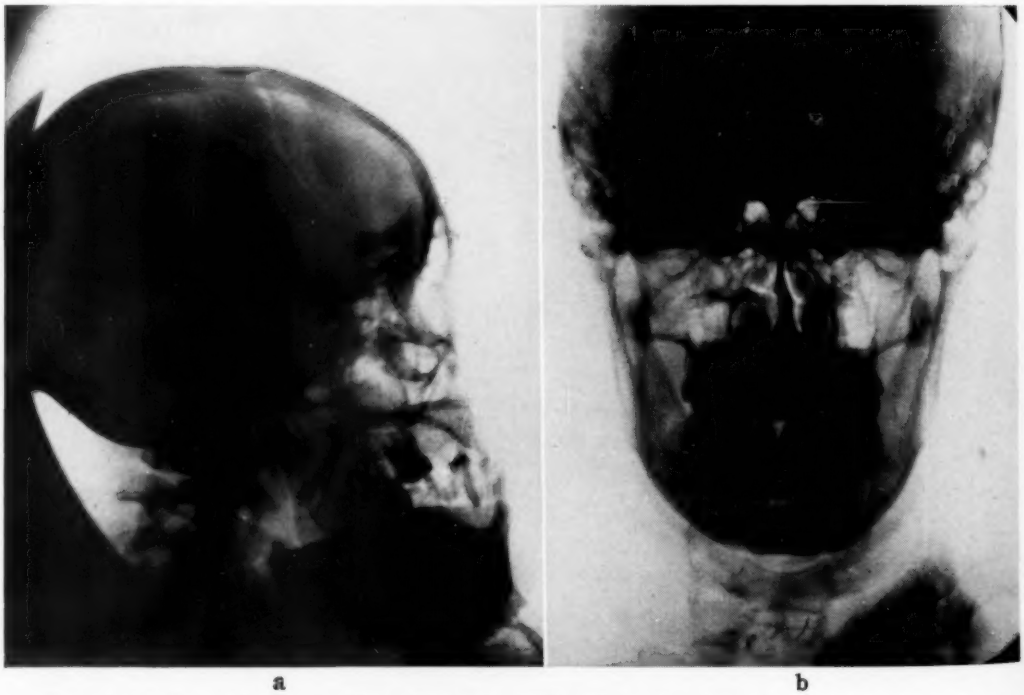

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FIG. 4. *Skull and both mandibles* (Feb. 19, 1959). The calvarium is normal in size, shape and thickness. There is no evidence of fracture, nor of increased intracranial pressure. The sella turcica appears normal. In the mandibles there is no evidence of fracture, nor bony abnormalities. There is an impacted molar in the left mandible. The lamina dura is present around the teeth.

She received physiotherapy and passive massage and motion, without benefit. On October 7, 1958, herpetic blisters appeared anteriorly on the right side of the chest below the right breast and extended laterally to the axilla and the posterior chest wall. The diagnosis was herpes zoster intercostalis. The condition eventually cleared up, leaving residual brownish pigmentation. In November 1958, following catheterization, she had low-grade cystitis with fever for five days. She repeatedly refused permission for a bone biopsy. On March 1, 1959, she was discharged, unimproved.

COMMENT

As the histologic picture of polyostotic fibrous dysplasia varies according to the stage of the disease at the time the biopsy specimen is obtained, the condition may be confused with Paget's disease, osteitis fibrosa cystica (parathyroid adenoma), giant-cell tumor, osseous xanthomatosis (Hand-Christian-Schüller disease), lipid granuloma of bone (Letter-Siwe disease) and Ollier's dyschondroplasia.

A clinical history, physical examination, and roentgenographic and blood chemical findings are all needed before an accurate diagnosis can be made by biopsy.

In the differential diagnosis, the following should be considered:

1. The segmental distribution of the bone lesions, regardless of whether or not they are associated with cutaneous pigmentation and precocious puberty.

2. The close resemblance of the roentgenographic picture to that in osteitis fibrosa cystica generalisata. Fibrous dysplasia differs in the following particulars: a) the presence of areas of increased density, especially in sites of predilection such as the femoral neck and the occiput; b) islands of cartilage in the long bones which form translucent areas of irregular outline, superficially resembling cysts; c) the "torn paper" appearance which is considered to be almost pathognomonic; and d) the slow advance over a period of many years.

3. The chemical findings. There is no increase in the urinary excretion of calcium. The normal levels of serum calcium and phosphorus differentiate it clearly from osteitis fibrosa of primary hyperparathyroidism. The alkaline phosphatase level may be normal or elevated, depending upon the amount of bone involved or the presence of a fracture.

4. The lamina dura surrounding the teeth is preserved. This finding serves to rule out hyperparathyroidism.

5. When bone involvement is slight, a biopsy is necessary to distinguish fibrous dysplasia from other conditions such as eosinophilic granuloma, endochondroma and hypernephroma—diseases in which the bone shows no areas of increased density. Neurofibromatosis may sometimes resemble fibrous dysplasia with both bone and skin lesions, but the bone lesions tend to occur at the foramina where the nerves enter the bone, and there are no areas of increased density.

Unfortunately, because of the refusal of our patient to permit biopsy, we were unable to rule out Paget's disease.

SUMMARY

A case is presented of unilateral bone dysplasia in a 63-year-old white female, following ipsilateral hemiplegia.

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H-3 (PROCAINE HYDROCHLORIDE) THERAPY IN AGING INSTITUTIONALIZED PATIENTS: AN INTERIM REPORT*

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It is important to call attention to some of the background for this study. Suddenly the Western World has been made aware of claims for a new approach to longevity and for relief from the effects of many chronic ailments. From the Parhon Institute of Geriatrics in Roumania come reports by Dr. Anna Aslan (1) on the use of H-3, a compound apparently identical with procaine hydrochloride. The Roumanian Government and the governments and clinics in other satellite countries make it a point to let no possible chance escape to obtain publicity for H-3. As a result, popular lay magazines in the United States and Canada publicize the "miracles" of H-3. The symbol itself is a potent panacea—mysterious, alluring and newsworthy. Claims of a second youth have poured forth, until either denial or confirmation has been deemed imperative.

Editorials in medical journals point out the need for double-blind studies in order to eliminate the distortion due to psychologic reactions and thus furnish a true evaluation. A noted medical editor has stressed that we are "only young once." The editor is quite right; nevertheless, the remark begs the question. The primary question is: does H-3 have therapeutic value? A secondary question is: does it allay symptoms to such an extent as to make one feel young again? The answers are of importance.

Ponce de Leon did not really fail to find the Fountain of Youth; he simply did not recognize it as the subterranean stream by which the average span of youthfulness has now been extended by more than thirty years. That it will stop at the present juncture is hardly probable, though it may be some time before we reach an era like that of Methuselah.

According to Dr. Aslan, rejuvenation is not the major value of H-3, but rather its curative properties in a variety of disorders. This is a moot question. British medical workers are at odds about the value of H-3. Since miracles have been claimed by Dr. Aslan's followers and protagonists, and since we are skeptical of panaceas and man-made miracles, we at Pinehaven decided to explore this field with a double-blind study. This method safeguards against psychologic errors, and was not used by the East European group. Our study of procaine (H-3) was undertaken despite the fact that, procaine therapy was previously rated as a failure in this field.

* Presented at the Annual Convention of the National Geriatrics Society, Miami, Florida, May 12, 1960.

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Some thirty years ago it was noted that when procaine hydrochloride was used as a pain killer, it had some therapeutic value in arthritis, nervous disorders and certain other conditions. Along with many another American physician, the author tried it for a while, with fear and trepidation. However, the dosage used was too small (1 to 2 ml.), it was administered for too short a time, and there was no knowledge of the rationale. Medicine in those days was more empiric.

Dr. Aslan states that H-3 exerts its action by means of the para-aminobenzoic effect, the vitamin prototype effect, and an effect on the central and sympathetic nervous systems. Whether or not this be so, past failures with procaine therapy should not be allowed to stand in the way of a thorough investigation. In view of the almost hysterical propaganda, great care should be taken to avoid the error of fitting the facts to the theory rather than adapting the theory to the facts. We attempted to conduct such a study.

MATERIAL

Since the material would have to be the same as that used by Dr. Aslan, we wrote to her and were told that our pharmaceutical houses produce a compound identical with H-3. Procaine hydrochloride (Novocain®)[1] in 2 per cent solution, pH 3–5, is H-3. A buffer is used, but only for the purpose of preserving the desired balance between alkalinity and acidity of the injectable material; it is not an active therapeutic agent. Later in our work we used Gerocaine (Kirk) instead of procaine, because claims were being made that it was more closely allied to Dr. Aslan's H-3. However, we found no difference in effect, and standard procaine is much cheaper. For the controls, we used physiologic solution of sodium chloride or buffered sterile water.

METHODS AND PATIENTS

The procaine solutions were allotted two separate numbers, and the control solutions two other numbers. This multiple numbering was used in order to make the possibility of distinguishing procaine more difficult for the staff.

All patients were tested twice for allergy to procaine before receiving it. The initial test was made by injecting 0.5 ml. of solution either intradermally or subcutaneously; if no reaction was noted within twenty-four hours, a second injection (2 ml.) was given intramuscularly. If there was still no reaction, only then was treatment begun.

Treatment consisted of injecting 5 ml. of solution intramuscularly three times a week for four weeks, followed by a ten-day interval with no treatment, after which the next series of twelve injections was started. Thus far, 4 courses have been administered.

Sixty geriatric patients were chosen for the study from a group with arthritis, nervous disorders and senile mental disturbances (Tables 1 and 2) who had received little or no benefit with previous treatments; 30 were given procaine solution and 30 were given control solutions. The odd-numbered patients received procaine and the even-numbered received the control material.

The design of the double-blind study involved taking a sample from the patients in the control group who remained unaffected, and another sample from those in the procaine group who might receive benefit, and then switching the treatment. The intent was to see if those whose mental or physical health was not influenced by the control solutions would be affected by the procaine solutions, and whether those receiving procaine would become worse when it was omitted.

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[1] In this paper we use the terms procaine (procaine hydrochloride), Novocain and H-3 interchangeably.

Later, when Kirk's Gerocaine was obtained, the subsequent 5 odd-numbered patients from the master list were given Gerocaine in order to compare the effects with those of procaine.

Among 65 patients tested for sensitivity, 2 had allergic reactions, in contrast to the claims of the Roumanians and Russians that the frequency is less than 1 in 1000. Any subject who showed a reaction was removed from the sample and the next alternate was put in his place. This was the only type of substitution allowed, except for that involving Gerocaine.

Late in the second course and during all of the third course, a respiratory epidemic swept Ocean County, New Jersey, felling both old and young. In some of the old people a fulminating type of pneumonia developed which sometimes caused death within twenty-four hours; in other cases, after apparent recovery, death occurred ten or twelve days later from either a cerebral or a coronary embolus. Thirty-two patients died in this period from all causes; 8 of these had terminal cancer and were omitted from the percentages of all deaths. The other deaths were as follows:

Patients receiving procaine therapy	1 death (3.3 per cent)
Patients receiving control solutions	3 deaths (12.0 per cent)
General institutional population	24 deaths (10.6 per cent)

In our locality the epidemic was thought to be Asiatic influenza. We did not concur in this diagnosis, since almost all of our staff and over 90 per cent of our patients had received the combined influenza vaccine a few months previously. The State Health Laboratory was called in. They took specimens of sputum and throat smears, both at Pinehaven and at the nearby Lakehurst Naval Air Base. These materials were injected into monkey kidney tissue and into eggs. The report for Pinehaven was that the cultures produced "no evidence of virus after three weeks." The causative agent was not determined. Whatever the cause, the disease was sometimes fatal and in many other cases constituted a setback which we were unable to evaluate.

RESULTS

During the first course, marked euphoria was noted in the patients receiving the water solution as well as in those receiving the procaine solution. However, there was no objective evidence of physical improvement in either group.

During the second course, only a few of the subjects receiving the control solutions manifested improvement, whereas those receiving procaine gradually projected the feeling of well-being into physical improvement that could be observed and recorded.

When the respiratory epidemic struck, there was a reversal which took nearly two weeks to overcome. The injections were continued in all except the patients who had pneumonia. Even in these cases no more than one or two injections were omitted during the height of the fever and respiratory embarrassment, and they were made up later at the end of the series before the pause interval.

The changes were slow in appearing. They were subtle rather than dramatic, and affected certain symptoms and signs entirely apart from those we had tentatively chosen as criteria. For example, one of the patients had hemiplegia and osteoarthritis which caused deformity but not total ankylosis. He wsa totally incontinent, had an extremely nasty disposition, and was such a personality problem that in no domicile had he responded either to the carrot or the stick. By the administrator's request, he had eventually been removed from every nursing home and hospital in which he had been a patient. He had been with us for four years and had been vile to the doctors, nurses and fellow-patients—

cursing, swearing and foul-mouthed at the drop of a pin. Somehow, he was persuaded to take procaine solution. During the third course, his mood changed. He became docile and cooperative, and it is now difficult for his fellow-patients to even needle him into a vile or nasty response. This alteration in mood has continued, and is most gratifying. So far, however, it is only that and nothing more. The arthritis has not responded to procaine therapy, nor has there been any change in the incontinence and hemiplegia.

During the third and fourth courses the changes that occurred were only slight, but they were increasingly observable and took place in more of the patients.

There have been no cures, but small improvements are acceptable gains in the development of individual personality. In these severely afflicted and otherwise unresponsive patients, any amelioration is a distinct benefit if it even slows progression of the disease or halts deterioration.

Two of the control group of subjects showed early slight improvement with respect to incontinence—an effect we had hoped to observe in the procaine group, but which failed to appear.

In the procaine group, slight improvement of various symptoms was widely distributed, and occurred even in an occasional case of brain syndrome. These manifestations were: 1) alteration in the gait associated with cerebrovascular disease (Critchley), 2) improvement in mood, 3) increased mobility, 4) decreased rigidity, and 5) the onset of a sense of well-being.

The medical staff did not notice any dramatic changes such as are produced by analeptics, tranquilizers and cerebral stimulants, or by physical therapy and measures to overcome decubitus ulcers induced by incontinence.

In any institution, the grapevine works with startling and spontaneous dispatch to bring total coverage of news about improvement or the contrary. Even when a patient has been bedridden for years and is unknown to 90 per cent of the other patients, any alteration such as sitting up in bed is at once noted and magnified.

As professional people, neither the doctors nor the nurses could accept such slight changes as dramatic. Nevertheless, some fair short-term results were observed, especially in view of the fact that they occurred in patients who had received no benefit or had regressed during previous treatment. The following are some representative case abstracts:

Case 1. On admission, this 60-year-old woman had arthritis with marked deformities. She had been treated with a variety of agents including gold therapy and massive doses of cortisone. During cortisone therapy, moon-face and camel hump had developed but the arthritic deformities and immobile joints had remained unchanged. She was allergic to aspirin and to aspirin products. She could tolerate the pain most of the time, but on occasion had to take opiates for relief.

After admission to Pinehaven, she was treated with prednisolone (Meticortelone) and later with triamcinolone (Aristocort); each drug afforded slight relief of pain and there were no side-effects, except for a high serum sodium level. This finding led to temporary discontinuation of the medication. She also received physical therapy, which has been continued to date. After treatment with procaine, she was able to manipulate her wheelchair

by herself, whereas she could not do so before procaine therapy. She could feed herself by flexion of the elbow, which remained the least affected joint.

During the second course of procaine, slight freedom of motion developed in both shoulders and slight improvement of motion in the knuckles and wrists. The deforming nodes and distortion of the joints were unaltered, but during both active and passive motion the improvement was such that the patient began to paint in recreational therapy classes. She can now raise her arms to about the shoulder level.

After the second course of procaine, her disposition improved, in association with freedom from pain and the hope engendered by the increased mobility of the joints.

She was one of the patients affected by the epidemic of respiratory disease.

Case 2. This 72-year-old woman was admitted in 1953 with left hemiplegia and myocarditis with decompensation. According to the doctor who referred her, she was "unable to care for self, unable to walk, must be lifted, is incontinent with Foley's catheter and has massive decubiti." The incontinence and edema cleared up in the course of a year. Then progress stopped. For five years, pain in the joints continued and her condition was static.

This patient, too, was affected by the epidemic of respiratory disease. In the previous month she had begun to experience beneficial effects from procaine therapy. She was generally improved; the pain disappeared except for slight recurrence at less and less frequent intervals; swelling of the hands disappeared; and she was able to move her shoulders although she could not lift her arms.

Case 3. Eight years ago this 76-year-old woman was admitted with right-sided hemiplegia and cardiovascular-renal disease. Motion of the right temporomaxillary joint was inhibited, and there was marked pain in the articulation of the right jaw associated with occasional moderate swelling of the right side of the face. Edema of the ankles was also present. Her voice seldom rose above a whisper and it was difficult to understand her speech. Though entirely bedridden, she was a cheerful, pleasant person.

During the second course of procaine therapy her voice became stronger and her speech more understandable. She could enter into conversation with her roommates. The swelling and pain in her face subsided. After many years in bed, she began to sit up and eventually could be out of bed two or three hours a day.

Case 4. This 50-year-old woman with advanced multiple sclerosis was paralyzed in both legs and the left arm. Though she was usually of a cheerful disposition, she fought any attempted improvement as useless. For years she had been entirely bedridden.

With procaine therapy, improvement began at the end of the second course and became progressively more marked. She could be transferred from her bed into a wheel chair daily, and was able to take part in the social life of the institution. She finally accepted physical therapy, which until then she had refused.

This patient also was affected by the epidemic of respiratory disease.

Indices of improvement

At the end of the fourth course, 29 of 30 patients originally in the procaine group were still receiving injections, but only 21 of those in the control group were receiving injections. Although no patient in the procaine group refused treatment, 6 in the control group thought it was useless. On this basis, one might be tempted to read significance into the results from the viewpoint of mental health.

TABLE 1

Clinical Data on Patients Treated with Procaine

Procaine Patient No.	Age & Sex	Diagnosis	Opinion Regarding Progress			Score for Agreement of Opinions	
			Patient	Nurses	Regular physicians	On progress	On lack of progress
1	67 M	Arthritis	+	+	+	3	
2	76 M	Peripheral vascular disease	+	+	+	3	
3	69 F	Conversion hysteria; lymphadenoma	*	+	*	1	2
4	74 M	Cerebrovascular accident; fracture of femur	*	*	*		3
5	49 F	Multiple sclerosis	+	+	+	3	
6	52 M	Parkinson's disease	+	+	+	3	
7	72 F	Cerebral arteriosclerosis; chronic brain syndrome; anxiety neurosis	*	+	+	2	1 (patient.)
8	78 F	Cerebral arteriosclerosis	+	*	+	2	1 (nurse)
9	85 M	Cerebral arteriosclerosis	+	+	+	3	
10	60 F	Arthritis	+	+	+	3	
11	49 F	Multiple sclerosis	+	+	+	3	
12	64 F	Psoriasis	*	*	*		3
13	76 F	Right hemiplegia	+	+	+	3	
14	89 F	Senility	+	+	*	2	1 (doctor)
15	87 M	Heart block	+	+	+	3	
16	76 M	Cerebral arteriosclerosis	+	+	+	3	
17	68 M	Senility	*	+	+	2	1 (patient.)
18	60 M	Multiple sclerosis	+	+	*	2	1 (doctor)
19	86 M	Cerebral arteriosclerosis	+	+	*	2	1 (doctor)
20	93 M	Arteriosclerotic heart disease; ulcers of stomach	+	+	+	3	
21	56 M	Cerebral arteriosclerosis; cerebrovascular accident	+	+	*	2	1 (doctor)
22	69 M	Cerebral arteriosclerosis; chronic brain syndrome	+	+	*	2	1 (doctor)
23	50 M	Parkinson's disease, post-encephalitic	+	+	+	3	
24	35 M	Syringomyelia	+	+	+	3	
25	90 F	Senility; cerebral arteriosclerosis	*	*	*		3
26	94 F	Arthritis; senility; cerebrovascular accident	+	+	+	3	
27	72 F	Cerebral arteriosclerosis; left hemiplegia	+	+	+	3	
28	61 F	Malignant hypertension	—	—	—		3†
29	98 F	Senility; chronic brain syndrome (complicated by abscess of neck, now resolved)	+	*	+	2	1 (nurse)

* No progress or became worse.

† Patient worse.

Twenty-four patients (aside from the terminal cancer patients) died in the institution during this period. The percentage of deaths among the controls approximated that in the institution at large, whereas the percentage of deaths among the procaine patients was only one-third as great. Whether this disparity will persist remains to be seen.

As may be noted in Table 1, among 29 patients receiving procaine, 25 (83.3

TABLE 2

Clinical Data on Control Patients

Control Patient No.	Age† & Sex	Diagnosis	Opinion Regarding Progress			Score for Agreement of Opinions	
			Patient	Nurses	Regular Physicians	On progress	On lack of progress
1	71 M	Arthritis	*	*	*		3
2	50 M	Multiple sclerosis	*	*	+	1 (doctor)	2
3	95 F	Senility; blind; cerebrovascular disease	*	*	*		3
4	80 M	CVA; chronic brain syndrome	*	*	+	1 (doctor)	2
5	63 M	Hemiplegia	+	+	+	3	
6	86 F	Parkinson's disease	*	*	*		3
7	58 M	Hemiplegia	+	*	*	1 (patient)	2
8	78 F	Senility; cerebral arteriosclerosis	*	*	*		3
9	84 M	Cerebral arterio-sclerosis	+	+	*	2	1 (doctor)
10	84 M	Senility; cerebral arteriosclerosis	*	+	*	1 (nurse)	2
11	90 M	Senility; prostatic enlargement	*	*	*		3
12	90 F	Senility; chronic brain syndrome	*	*	*		3
13	53 M	Parkinson's disease	*	*	+	1 (nurse)	2
14	86 F	Cerebral arterio-sclerosis	*	*	*		3
15	85 F	Chronic brain syndrome	*	*	*		3
16	72 M	Chronic brain syndrome	*	—	*		3
17	85 F	Left hemiplegia; general arteriosclerosis	*	*	*		3
18	83 F	Arteriosclerotic heart disease	+	*	+	2	1 (nurse)
19	80 F	Ulcers of stomach	+	+	*	2	1 (doctor)
20	77 F	Cerebral arteriosclerosis; myocarditis	*	*	*		3
21	80 M	Cerebral arteriosclerosis	*	*	*		3

† The average age of the original 30 patients was 77.1 years. Those who refused to continue treatment were mostly the younger group without cerebral irritation.

Three patients died. Six refused to continue treatment because they were not receiving any benefit.

* No progress or became worse.

per cent) showed improvement of some kind, even though slight. In many instances this improvement was progressive. Eventually, in a fair number, there was evidence of restorative values.

Table 2 shows the data for the control group of 21 patients. Nine (30 per cent) experienced improvement of some kind. One manifested marked and rapid restoration of faculties.

The scores for agreement concerning improvement are shown in Tables 1 and 2. One credit (plus sign) each was allowed for the opinion of the patient, the charge nurse, and the regular physician. Thus 3 credits in the "agreement on

TABLE 3

Laboratory Data on Patients Receiving 4 Courses of Procaine Therapy

Patient No.	Leukocyte Count (per cu. mm.)		Serum Cholesterol (mg./100 ml.)		Serum Calcium (mg./100 ml.)	
	At beginning	At end of 4th course	At beginning	At end of 4th course	At beginning	At end of 4th course
1	7800	+9000	250	−200	20.0	−11.6
2	12000	−10200	170	−125	11.6	−10.0
3	7800	+8400	340	−160	14.8	−14.4
4	7600	+8000	200	−125	13.6	−8.4
5	7400	+7800	200	−160	11.6	11.6
6	9100	+10500	220	−205	19.6	−12.0
7	9900	−8000	100	+230	20.0	+24.0
8	9500	−8000	100	+180	13.6	+25.6
9	7900	+8200	200	−150	13.6	13.6
10	8400	+11900	170	−110	13.6	−11.6
11	9100	+11100	140	+225	8.4	+16.4
12	7000	+9800	140	+230	10.0	+13.6
13	7300	+9000	200	−125	14.8	+20.0
14	6500	+9200	170	−70	11.6	+16.8
15	7800	+8000	185	−100	14.0	−11.6
16	6300	+9600	100	100	10.0	+11.6
17	7000	+8400	200	−125	12.8	+15.6
18	8000	−7900	170	−85	12.0	+13.6
19	8700	−8600	250	−125	10.0	+20.0
20	8900	−8500	150	−140	14.8	+20.0
21	7800	+8700	150	−100	13.2	+13.6
22	7500	+8250	125	−85	14.0	−6.0
23	6700	+12800	200	−80	11.6	−8.8
24	8700	+15000	200	−90	17.6	+18.8
25	6000	+6500	250	−100	8.0	+10.0
26	7200	+9400	100	+200	14.8	+18.0
27	5400	+7900	140	−130	12.4	+19.2
28	8000	+13000	190	−100	8.8	+14.8
29	7200	+7800 (+23)*	230	−140 (−23)†	11.6	−8.4 (+17)*
Averages	7806	8600	177	138	13.2	16.6

* Number of patients showing an increase.
† Number of patients showing a decrease.

progress" column indicates marked improvement; 2, moderate improvement; and 1, slight improvement. The scores were as follows:

Control group: 1 marked, 3 moderate, and 5 slight.

Procaine group: 15 marked, 9 moderate, and 1 slight.

Early benefit from procaine therapy consisted of a sense of well-being, a more normal mental attitude toward self and others, greater muscular power, and improved texture of the skin. Sphincter control was not significantly altered. As the number of courses increased, so did the number of patients showing improvement—in contrast to the control group.

A pattern slowly emerged of disorders in which procaine had early therapeutic effects; namely, arthritis, senile parkinsonism, cerebral arteriosclerosis with or without chronic brain syndrome, cerebral palsy (regarding muscle control), and multiple sclerosis.

Laboratory data (Tables 3 and 4)

In the early stages of procaine therapy there was no change in liver function (blood tests) or in the serum sodium and potassium levels.

TABLE 4

Laboratory Data on Patients Receiving 4 Courses of Control Treatment

Patient No.	Leukocyte Count (per cu. mm.)		Serum Cholesterol (mg./100 ml.)		Serum Calcium (mg./100 ml.)	
	At beginning	At end of 4th course	At beginning	At end of 4th course	At beginning	At end of 4th course
1	6200	+7000	170	+175	3.6	+8.4
2	6800	+7500	110	+150	11.6	+13.6
3	7500	−7000	200	−140	18.8	−12.4
4	8200	8200	175	−170	14.4	+14.8
5	8000	−6800	150	+220	12.2	+17.2
6	7000	+7800	180	+190	11.6	11.6
7	8100	−8000	280	−260	14.8	+17.2
8	7300	+7800	200	+220	13.6	−11.6
9	8400	−8000	140	140	17.6	−17.2
10	7200	+8600	165	−150	14.6	+15.6
11	8000	−6400	170	+180	14.4	+17.2
12	7500	+9000	230	−205	16.4	−14.8
13	6900	+7200	185	+210	13.6	+23.2
14	8500	−8200	140	140	10.6	−8.0
15	8000	−6900	200	+230	17.2	−15.2
16	7500	+7900	150	−120	17.6	−11.6
17	7000	+7600	100	+305	15.2	−11.6
18	7200	+9800	200	−180	12.4	+16.4
19	7400	−7100	160	+250	14.0	14.0
20	6900	+8900	170	+250	11.6	+24.8
21	6200	+11500 (+12)*	170	−110 (−8)†	6.0	+15.6 (+11)*
Averages	7420	7960	173	188	13.46	+14.6

* Number of patients showing an increase.

† Number of patients showing á decrease.

There was a decrease in the blood cholesterol level in 23 of the patients in the procaine group. Dr. Aslan, on the other hand, found an increase in cholesterol concentration. The difference may be due to the higher initial level caused by the high fat content of the American diet.

Serum calcium concentration increased in 17 of the patients in the procaine group. A rise was also observed in some of the patients in the control group.

There was an increase in the leukocyte count, with no alteration in the differential count, in 23 of the patients in the procaine group. This, too, is not in accord with Dr. Aslan's findings of a decrease in the leukocyte count.

SUMMARY AND CONCLUSIONS

So far, we have found no evidence to substantiate Dr. Aslan's claims that procaine (H-3) therapy reduces the biologic age below the chronologic age. Neither have we noticed increased libido in the patients studied.

There were no side-effects in our series of patients, who were all pre-tested with procaine.

Enough potential worth has been revealed, however, to justify continuation of the study, using procaine as adjunctive treatment.

Despite the fair results obtained in a group of previously unresponsive patients, no long-term conclusions can be drawn on the basis of such a short period of study. It will take at least a year before any realistic evaluation can be made.

Meanwhile procaine may safely be given in addition to other treatment in pre-tested patients afflicted with nervous disorders or senile mental disturbances, with the expectation that some of them will experience improvement of mood and personality traits. After patients with chronic brain syndrome have been followed for longer periods, perhaps a pattern of benefit may emerge, as noted already in some patients with arthritis and certain chronic nervous disorders.

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HYPERTENSION AND EDEMA IN THE AGED. COMPARISON OF HYDROCHLOROTHIAZIDE AND A HYDROCHLOROTHIAZIDE-SYROSINGOPINE COMBINATION

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The now abandoned concept of normal blood pressure being "100 plus the age" was not without some basis in fact. Hypertension is common in the older age group and one frequently finds blood pressure readings of 150/90 or higher in apparently normal persons. Conversely, there are many hypertensive patients in the older age group who have serious vascular disease and who require careful evaluation and constant medical management. The increase in life span has brought with it an increase in degenerative changes, arteriosclerosis and chronic renal disease, all of which may predispose to an elevation of blood pressure. Brest and Moyer (1) have rightly pointed out the vicious cycle that can be established in persistent diastolic hypertension, leading to further vascular deterioration, particularly in the kidneys, brain and heart. The duty of the physician is to minimize these changes as far as possible.

The Methodist Home for the Aged in Philadelphia at present has 250 guests, ranging in age from 71 to 100. Only 22 are males. As one might expect, there is a high incidence of vascular disorders. A certain degree of hypertension is probably consistent with good health in these people, so they are not treated unless readings are abnormally high or symptoms and signs develop. Even so, the proportion of patients receiving drugs such as digitalis, vasodilators, antihypertensives and diuretics is much higher than in an active general practice.

The expense, inconvenience and pain involved with injectable diuretics led us to investigate the efficacy of an oral diuretic (hydrochlorothiazide) and also of the same diuretic in combination with a synthetic rauwolfia alkaloid (syrosingopine).

Hydrochlorothiazide (Fig. 1) has been extensively studied during the past few years (2–7) and reported to be an efficient diuretic with moderate antihypertensive activity. Like most diuretics, it tends to interfere with electrolyte balance, but not to the same degree as some of the others. Increased loss of potassium in the urine is the chief problem.

Syrosingopine is a synthetic analog of reserpine and exerts the favorable cardiovascular effects of compounds found naturally in rauwolfia root, but has fewer side-effects. Chemically, it is carbethoxysyringoyl methlreserpate (Fig. 2). Like all rauwolfia drugs, its greatest usefulness is in the treatment of mild to moderate forms of hypertension. A dose of 1 mg. is equivalent to 50 mg. of the raw root and to 0.25 mg. of reserpine. Like all rauwolfia drugs, its onset of action is delayed, ranging from seven to ten days after administration (8, 9). Although

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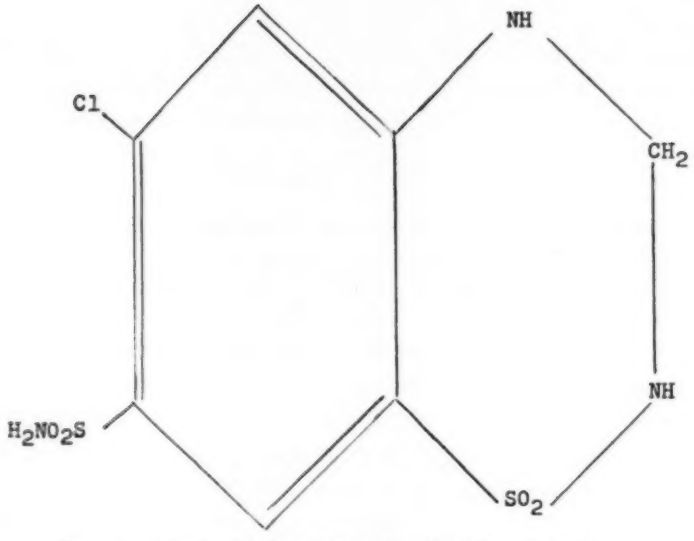

FIG. 1. Structural formula of hydrochlorothiazide

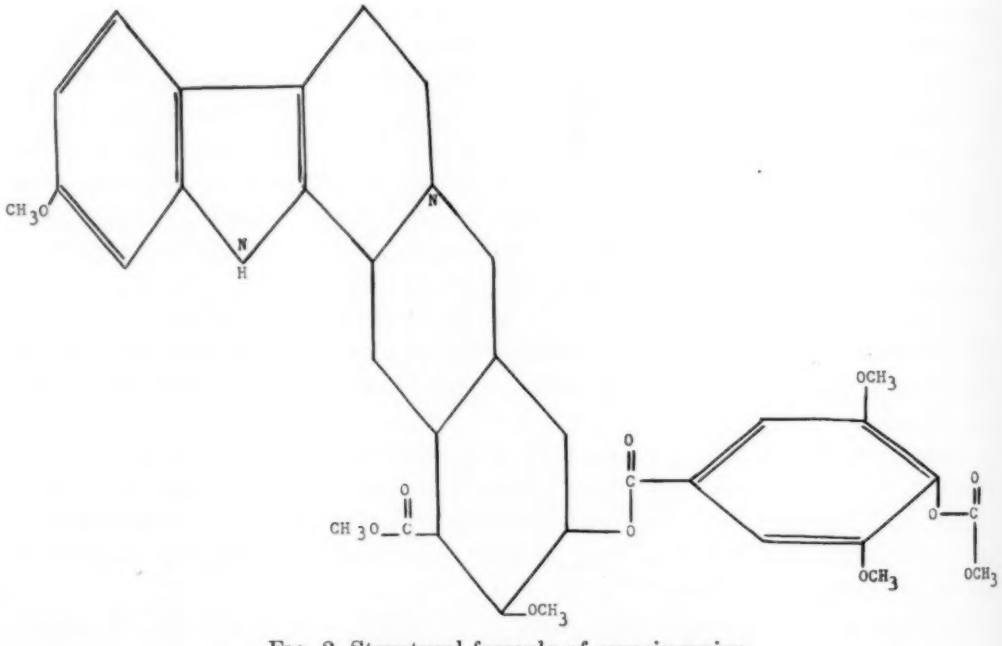

FIG. 2. Structural formula of syrosingopine

syrosingopine has no diuretic activity, it is synergistic with hydrochlorothiazide in lowering blood pressure.

Since the chief disadvantage of prolonged diuretic therapy is disruption of the electrolyte balance, the diuretic should be given in the smallest dose necessary to maintain a satisfactory clinical state in association with reasonable lowering of the blood pressure.

This investigation was undertaken to compare the clinical responses and laboratory findings during treatment with each type of preparation.

MATERIAL AND METHODS

Material

Hydrochlorothiazide (Esidrix®)[1] was used in the form of 50-mg. tablets. The combination tablet (Singoserp-Esidrix®)[1] contained 1 mg. of syrosingopine and 25 mg. of hydrochlorothiazide.

Methods

This study was carried out on 63 ambulatory patients in the Methodist Home for the Aged. The youngest patient studied was 71 and the oldest was 87. All partook of a standard diet, but were instructed to refrain from using salt at the table for seasoning. No other effort was made to prepare special salt-free diets. A level of 150/100 mm. Hg was taken as the normal blood pressure (10); an increase in either the systolic or diastolic pressure was considered to be hypertension. Only patients who presented themselves at sick call with symptoms suggestive of hypertension or edema were selected. Patients previously receiving rauwolfia drugs were given placebo tablets for two weeks to permit excretion of the drug and establishment of a base line before starting the drugs under investigation. Injectable diuretics were also stopped, but oral diuretics were started without delay to prevent undue degrees of edema.

Before starting any therapy, blood was drawn for determination of blood urea nitrogen, sodium and potassium levels. Hydrochlorothiazide was then started in a dosage of 50 mg. twice a day for four weeks. The patient was seen at weekly intervals. After four weeks, blood was again drawn for the same studies and the diuretic was stopped. The combination tablet was then given three times a day; this involved a decrease of 25 mg. in the daily dose of hydrochlorothiazide. After four more weeks, the levels of blood urea nitrogen and electrolytes were again determined. Dosage was then gradually reduced on an individual basis until a maintenance dosage satisfactory for control of the edema and blood pressure was determined.

Patients already taking additional drugs such as digitalis or coronary dilators were permitted to continue them. No potassium supplements were given, although when potassium levels were below normal the patients were instructed to drink two glasses of orange juice daily.

At each weekly visit records were kept regarding weight, blood pressure, edema, and the presence or absence of dyspnea, dizziness, headace, stuffy nose, depression and nightmares; the latter three symptoms have been reported as side-effects of rauwolfia drugs (8, 9). The monthly laboratory determinations were recorded. All reading of blood pressure and weighing of patients was performed by only one nurse. All clinical evaluations were made personally by the author. Thus error in poorly definable measurements (*e.g.*, the amount of edema) was kept to a minimum. Each patient received both types of medication and became a complete entity for comparison. No control group was deemed necessary.

RESULTS

Weight, blood pressure, the amount of edema, and biochemical changes in the blood are objective factors that lend themselves to accurate determination. The patient's symptoms are equally important, but are subjective in nature and not as reliable.

[1] Ciba Pharmaceutical Products, Inc., Summit, N. J.

Weight

Table 1 shows the changes in weight with each medication. Weight is intimately connected with the amount of fluid retained in the body, and decreases in proportion to the increase in excretion of fluid. Before any therapy was given, the mean weight for the 63 patients was 139 pounds. After four weeks of diuretic therapy, the mean weight was 137 pounds, a loss of 2 pounds. After four weeks of the combined therapy (eight weeks of total therapy) the mean weight had decreased another pound to 136 pounds. This drop in weight was not spectacular, but it should be borne in mind that many of these patients were already receiving other forms of diuretic therapy, and in none was the edema uncontrolled.

Blood pressure

Table 2 shows the various changes in blood pressure. The trend toward lowering of both systolic and diastolic components is evident. The mean systolic value dropped from a pre-treatment level of 187 mm. Hg to 162 mm. with the use of hydrochlorothiazide, and to 154 mm. when syrosingopine was added. The corresponding mean diastolic values dropped from 111 to 96, to 88 mm.—an impressive decrease. Although blood pressure notoriously varies in the same patient, a mean systolic drop of 33 mm. and a mean diastolic drop of 23 mm. over a period of two months is statistically significant.

TABLE 1

Changes in Weight

	Average Weight (lbs.)	Average Loss (lbs.)	Range of Weight (lbs.)
Before treatment	139	0	105–237
During treatment with hydrochlorothiazide	137	2	105–230
During treatment with hydrochlorothiazide + syrosingopine	136	3	104–232

TABLE 2

*Changes in Blood Pressure**

	Mean Blood Pressure (mm. Hg)		Range of Blood Pressure (mm Hg).	
	Systolic	Diastolic	Systolic	Diastolic
Before treatment	187	111	156–240	100–130
During treatment with hydrochlorothiazide	162	96	140–230	90–114
During treatment with hydrochlorothiazide + syrosingopine	154	88	130–200	70–102

* Standard: 150/100 mm. Hg.

Edema

The clinical measurement of edema is not exact. In order to minimize error, all evaluations were made by one person and the gradations recorded in the classic 1-plus to 4-plus manner. Edema was rated as 1-plus when it was barely detectable, 2-plus when there was obvious pitting, 3-plus when there was a further increase, and 4-plus when it was severe enough to prevent the patient from putting on shoes. This classification admittedly is ill-defined and has serious drawbacks. However, it seems justified since it is the one commonly employed in the everyday practice of medicine.

Both of the medications used have diuretic activity and a determination of the amount of edema present before and after therapy is essential. Table 3 shows the responses. Before therapy 9.5 per cent of patients had no clinically detectable edema and 91.5 per cent had fluid retention of varying degrees; 71.5 per cent became edema-free with hydrochlorothiazide, and the remaining 28.5 per cent still had edema, though slight in amount. During treatment with the combination tablet, a few more patients (38.2 per cent) had mild edema, but none had edema classifiable as 2-plus or more. Even with the eventual decrease in the dosage of medications, no serious fluid retention developed.

Levels of blood urea nitrogen, sodium, and potassium

Table 4 shows the blood chemical data. Normal blood urea nitrogen levels in this laboratory are from 7.0 to 17.0 mg. per 100 ml. of whole blood. No patient

TABLE 3

Changes in Amount of Edema

	No Edema		Edema 1+		Edema 2+		Edema 3+		Edema 4+	
	#*	%	#	%	#	%	#	%	#	%
Before treatment	6	9.5	12	19.5	15	23.3	24	38.2	6	9.5
During treatment with hydrochlorothiazide	45	71.5	18	28.5	0	0	0	0	0	0
During treatment with hydrochlorothiazide + syrosingopine	39	61.8	24	38.2	0	0	0	0	0	0

* Number of patients.

TABLE 4

Changes in Levels of Blood Urea Nitrogen, Sodium and Potassium

	BUN (mg./100 ml.)	Sodium (mEq./L.)	Potassium (mEq./L.)
Before treatment	12.3	136	4.1
During treatment with hydrochlorothiazide	12.4	134	3.5
During treatment with hydrochlorothiazide + syrosingopine	12.5	137	3.9

in this study showed an elevation above the upper limit of normal, and it may therefore be assumed that all had reasonably adequate renal function. Regardless of the drug given, the concentration of blood urea nitrogen was maintained at a remarkably even level, the mean values being 12.3 mg. per 100 ml. before therapy, 12.4 mg. during diuretic therapy, and 12.5 mg. during combined therapy. Thus, given adequate renal function, prolonged diuretic therapy apparently does not materially alter the level of blood urea nitrogen.

The data in Table 4 also show that the serum sodium level is not changed, the mean level being 136 mEq. per liter before therapy, 134 mEq. during diuretic therapy, and 137 mEq. during combined therapy. (Normal levels in this laboratory range from 134 to 140 mEq. per liter.) Although increased sodium diuresis has been reported with hydrochlorothiazide (3), the serum levels in this study were remarkably constant. Assay of urinary sodium would have been of value, but unfortunately facilities were not available.

The major problem with all diuretic drugs is the loss of potassium by way of the urine. The findings of our study upheld this observation. Normal values in this laboratory for serum potassium are 3.9 to 4.5 mEq. per liter. Table 4 shows that the serum level of this electrolyte was directly influenced by the amount of diuretic given. After administration of 100 mg. of hydrochlorothiazide daily for four weeks, the mean serum potassium level fell to 3.5 mEq. per liter compared to 4.1 mEq. before therapy. When the dosage was decreased to a total of 75 mg. of the diuretic substances daily, the mean serum potassium level rose to 3.9 mEq. per liter (at best, low normal). The lowest level observed in any of the patients was 2.5 mEq. per liter. When the level fell below 3.9 mEq. per liter, orange juice was given twice daily to provide a ready supply of potassium ion. Potassium plays an important role in cellular metabolism. Symptoms of hypopotassemia are largely those of muscle weakness, particularly in the heart, skeletal muscles and intestines (11). A constant watch should be kept to guard against decrease in tone of the large muscle groups, drowsiness, weakness, lethargy, muscle pain, oliguria, and intestinal atony. During hydrochlorothiazide therapy 39 patients (62.0 per cent) had serum potassium levels below 3.9 mEq. per liter. During combined therapy 24 patients (38.1 per cent) had subnormal levels. Despite this frequent occurrence of hypokaliemia, no patient showed any of the foregoing symptoms.

Clinical symptoms

The subjective symptoms most often noted before treatment were dyspnea, dizziness and headache. The data are shown in Table 5. A decrease in the incidence of these symptoms was associated with both types of medication. The decrease in dyspnea was associated with a decrease in edema, particularly in the pulmonary system. The decrease in dizziness and headache during treatment with the combined drugs was dramatic. The incidence of headache fell to only 1.6 per cent.

The stuffiness of the nose, depression and nightmares noted during treatment with certain rauwolfia drugs were not observed in this study, nor were any other

side-effects noted. This indicates that syrosingopine produces fewer side-effects than other rauwolfia derivatives (8, 9).

COMMENT

The presence of hypertension or edema at any age calls for vigorous management; in the geriatric patient, the probability of pre-existing degenerative changes in the vascular bed makes treatment even more important. A certain amount of elevation in blood pressure, however, is probably physiologic in the elderly person, so treatment should not be so vigorous as to cause undue hypotension. Edema, on the other hand, should be strictly controlled.

Diuresis is the only effective means of eliminating edema fluid. All diuretics, whether they be oral, injectable or in suppository form, disrupt electrolyte balance, as would be expected when the osmolarity of the body fluids is changed. Adequate renal function allows maximum adjustment of the body to these changes. Although it is not the ideal index of function, the blood urea nitrogen level serves as a rough guide to kidney activity. Sodium retention is a cause of elevation of blood pressure, and therefore restriction of sodium intake is important in the management of hypertension. Prolonged diuretic therapy, however, calls for some relaxation in sodium restriction. The patients in this study were permitted the usual seasoning in the cooking of foods, but were not allowed to use additional salt at the table. The remarkable constancy of the serum sodium level suggests that this is an acceptable procedure from the standpoint of electrolyte balance. The patient is also spared the unpleasantness of eating food cooked without salt.

Loss of potassium continues to be the major obstacle to efficient diuresis. Most vegetables contain adequate amounts of potassium, but institutional cooking frequently is such that the mineral content is diluted and discarded, leaving the food deficient in mineral elements. The steady decrease in serum potassium levels noted in this study suggests that potassium excretion varies with the dose of the diuretic. Despite the fact that no untoward symptoms appeared, it would have been well to insist upon large doses of citrus juices (8 ounces, twice daily) or potassium chloride (1.0 Gm., two to four times daily).

Hydrochlorothiazide lowers the blood pressure, and its antihypertensive

TABLE 5

Changes in Clinical Symptoms

	Dyspnea		Dizziness		Headache	
	#*	%	#	%	#	%
Before treatment	36	57.2	45	71.5	48	76.2
During treatment with hydrochlorothiazide	12	19.1	18	28.5	12	19.1
During treatment with hydrochlorothiazide + syrosingopine	9	14.3	6	9.5	1	1.6

* Number of patients.

activity is potentiated by syrosingopine, allowing for a reduction of the dose of diuretic substance without a decrease in control of the disease. For the patient who has only edema but no elevation of blood pressure, the addition of syrosingopine is unnecessary. The dose must be individualized, administering the smallest amount that will produce an adequate clinical response. In this series, all patients could be controlled with oral therapy and no supplemental injections were required.

SUMMARY

The effect of oral administration of hydrochlorothiazide and a hydrochlorothiazide-syrosingopine combination was evaluated in 63 geriatric patients in a home for the aged. Hydrochlorothiazide alone was given for a period of one month; then the combined drugs were substituted for another month.

Both forms of therapy produced significant lowering of the blood pressure, and a decrease in body weight, edema, dyspnea, dizziness and headache. Serial determinations showed no significant change in the levels of blood urea nitrogen or serum sodium, but serum potassium levels dropped in proportion to the dose of diuretic, indicating the need for supplemental potassium therapy.

No serious side-effects were noted.

Acknowledgment

I am indebted to Miss Kathryn Lehman, Administrator, and Miss Gertrude Parkhill, head nurse, for their splendid cooperation in this study; and to Dr. Harry L. Baird of CIBA for the generous supplies of Esidrix and Singoserp-Esidrix.

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HYDROCHLOROTHIAZIDE AND SYROSINGOPINE IN THE CONTROL OF HYPERTENSION

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The effect of chlorothiazide and hydrochlorothiazide and their derivatives in the treatment of hypertension has been well authenticated (1). Various combination of hydrochlorothiazide with other agents have also been used (2). Recently a new derivative of *Rauwolfia serpentina* has been reported, namely, syrosingopine (Singoserp) (3, 4). This paper presents preliminary clinical experience with a combination of syrosingopine[1] and hydrochlorothiazide[1] in the treatment of hypertension. In addition a comparison is made with results in a control series of patients who were treated with reserpine and hydrochlorothiazide.

METHOD

Thirty patients with blood pressures (multiple readings) over 150 mm. Hg systolic and 90 mm. diastolic were given 0.50 mg. of syrosingopine combined with 50 mg. of hydrochlorothiazide daily. They were observed initially at two-week intervals, then monthly thereafter. If normotensive levels were obtained within two weeks the original dose was maintained. If normotensive levels were not reached within two weeks, the dose of hydrochlorothiazide was raised progressively by 25 mg. and the dose of syrosingopine by 0.25 mg. daily in alternate patients. This procedure was continued until normotensive blood pressures were obtained or until toxic effects prevented further increase. Weight, blood pressure, pulse and any clinical side-effects were noted.

A control group of 15 patients were given a combination of reserpine and hydrochlorothiazide, and the dose of each drug similarly titrated until normotensive levels were reached. The same observations were made as in the previous group.

The 45 patients ranged in age from 30 to 77 years, averaging 54.5 years. There were 13 males and 32 females. The lowest initial blood pressure was 160/90 and the highest was 220/120. All were observed for a period ranging from twelve to fourteen months.

RESULTS

Of the 30 patients given syrosingopine and hydrochlorothiazide, 7 did not take the drug properly with regard to dosage or duration; even so, they experienced good effects in that the blood pressure returned to normotensive levels. Two patients were forced to stop the drug because of toxic effects consisting of abdominal cramps in one, and drowsiness in the other. In 1 patient there was no response in blood pressure even with 1.0 mg. of syrosingopine and 100 mg. of hydrochlorothiazide daily.

Table 1 shows the dosage combinations used and the number of patients in whom the blood pressure returned to normotensive levels. There was no significant alteration in pulse rate or in the rhythm of the heart. Likewise there was

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[1] Syrosingopine (Singoserp) and hydrochlorothiazide (Esidrix) were supplied by CIBA Pharmaceutical Products, Inc., Summit, N. J.

TABLE 1

Response to Hydrochlorothiazide and Syrosingopine

No. of Patients with B.P. Returning to Normotensive Level	Daily Dose (mg)	
	Hydrochlorothiazide	Syrosingopine
10	50	0.50
1	50	0.75
2	100	0.50
3	100	0.75
1	50	1.00
3	100	1.00

20 patients in above group.
7 patients did not take the drug properly.
2 patients had side-effects (7%).
1 patient showed no response with 1.0 mg. of syrosingopine plus 100 mg. of chlorothiazide.
—
Total 30

TABLE 2

Control Group: Response to Hydrochlorothiazide and Reserpine

No. of Patients with B.P. Returning to Normotensive Level	Daily Dose (mg.)	
	Hydrochlorothiazide	Reserpine
6	50	0.50
2	50	1.00
1	100	0.50
1	100	1.00

10 patients in above group.
3 patients had nightmares and insomnia
2 patients had severe nasal congestion } (33%).
—
Total 15

little change in weight, the maximum being ±3–4 pounds over a twelve-month period.

Table 2 summarizes the date on the control group receiving a combination of reserpine and hydrochlorothiazide. Although the doses of both drugs in the control group were similar to those in the syrosingopine-hydrochlorothiazide group, 5 patients (33 per cent) had to stop the combination because of nightmares, insomnia or nasal congestion.

DISCUSSION

The largest group (10 patients) responded to a combination of 50 mg. of hydrochlorothiazide and 0.50 mg. of syrosingopine daily. Only 3 patients required 1

mg. of syrosingopine and 100 mg. of hydrochlorothiazide per day in order to maintain normal blood pressure. An additional 6 patients required 0.75 mg. of syrosingopine but larger doses of hydrochlorothiazide. Sixteen out of 20 patients needed less than 1.0 mg. of syrosingopine to achieve a normal blood pressure level. This is significant, in that the dosage of syrosingopine was small in comparison to the usual dosage of this drug when used alone (2–4 mg. per day). Thus the synergistic action of small dosages of syrosingopine with hydrochlorothiazide makes this an effective combination in lowering moderately elevated blood pressure to normotensive levels.

The side-effects were minimal—probably the result of using small doses of each drug. Only 2 patients out of 30 had to stop the drug for this reason. This is in marked contrast to 5 out of 15 patients who had to stop reserpine and hydrochlorothiazide because of side-effects such as nightmares and nasal congestion. The combination of syrosingopine and hydrochlorothiazide not only has the hypotensive effects of reserpine and hydrochlorothiazide but has the added advantage of causing fewer side-effects.

SUMMARY

A one-year study of the hypotensive effects of a combination of hydrochlorothiazide and syrosingopine is presented. The combination of these two drugs in small dosage (0.50 mg. of syrosingopine and 50 mg. of hydrochlorothiazide daily) lowered moderately elevated blood pressure to normotensive levels in more than half of 30 patients. The hypotensive effects were comparable to those of reserpine combined with hydrochlorothiazide in a control group of 15 patients, but there were fewer side-effects.

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THE CLINICAL IMPORTANCE OF GASTRO-INTESTINAL GAS, ESPECIALLY IN RELATIONSHIP TO CARDIOVASCULAR DISEASE

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The subject of gastro-intestinal gas has interested physicians for centuries. Its clinical importance and pathologic physiology, however, is still not well understood and will require further continued research. There are many reasons for this. One is the apparently contradictory findings appearing in the literature from time to time; another is the loss of the broad scope of general practice as specialization in medicine becomes more and more restricted. We older physicians remember that one of the first acts of the old family doctor was to inquire as to the function of the gastro-intestinal tract and then to look at the tongue.

The older literature refers to acute abnormal accumulations of visceral gas as meteorism, and to the chronic condition as tympanites. Flatulence is a term denoting great accumulations of gas, which are being removed by eructation and flatus.

The most common gases in the alimentary canal are oxygen, nitrogen, carbon dioxide, hydrogen, ammonia, methane and hydrogen sulphide. Others may exist, but usually in small quantities. Oxygen is absorbed and is not found in the intestines (1).

There are many ways in which gases reach the alimentary canal, or develop within it. They are not found in the fetus; in fact, roentgenologic evidence of gastro-intestinal gas in the fetus before birth suggests extra-uterine life. Shortly after birth, usually within fifteen minutes, air appears in the intestinal tract (2). A large amount of air is known to enter the digestive tract during the act of swallowing food or saliva. This is especially the case in patients with nervous or psychiatric disorders. Certain fermentable foods such as grape juice, beer, and those containing cellulose (*e. g.*, cabbage, turnips, peas, beans and lentils) are acted upon by bacteria and other ferments to produce accumulations of gas within the intestines. Accumulations also occur when too little gas is removed by the normal channels, as in cases of primary intestinal obstruction, or in association with atony or inhibition of the visceral intestinal musculature during acute illnesses such as pneumonia, infectious fevers, peritonitis or sepsis. Any condition interfering with the exchange and absorption of gas or with the circulation to the gastro-intestinal viscera tends to produce accumulations of air. Among some of the other conditions favoring the formation of gases are bad eating habits, constipation, nervousness, irritating foods, cathartics, food allergy and irritating enemas.

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SYMPTOMATOLOGY

Directly or indirectly, gastro-intestinal gas induces a complex symptomatology, relating to almost any field of medicine. Therefore the physician with the broad outlook must ever be on the alert. The manifestations may be pain or discomfort in the neck, chest, precordial area, left shoulder, arms or left upper abdominal quadrant, cramplike pains, sensations of fullness, distention, abdominal gurgling or rumbling, belching, excessive flatus, choking sensations, dyspnea, abnormal cardiac rate or rhythm, anginal pains, nervousness, apprehension, insomnia and various other neurologic disturbances.

The cardiovascular manifestations are common and often confusing. Patients are frequently shifted from the cardiologist to the gastro-enterologist, and vice versa. In heart disease, gas may develop owing to the disturbed visceral circulation. Large amounts of air in the stomach or splenic flexure may raise the hemidiaphragm and encroach upon the heart, causing embarrassment to the circulation (3).

Excessive amounts of intestinal gas may be associated with embolism of the intestinal blood vessels, simulating acute abdominal conditions, or may be associated with congestion of the viscera due to heart failure, or visceral hemorrhage due to hypertension and other circulatory conditions. Dysphagia has been observed in patients with a dilated left auricle or aneurysm causing pressure on the esophagus. Clinically it has been known for a long time that excess intestinal gas is a factor in the production of anginal attacks and all sorts of disturbances in the rate and rhythm of the heart. Only the mechanism has not been well understood. Whether it is chemical, mechanical, reflex, or a combination of these factors is not yet clear. There is strong experimental evidence in favor of the reflex nature of the acute attacks of angina pectoris caused by intestinal gas. By blowing up the stomach with air, chest pain and cardiac irregularities can be produced (3), probably because nerve fibers from both the heart and gastro-intestinal tract enter the same segment of the spinal cord thus permitting a crossed reflex arc.

The mechanism of the crossed reflex arc also probably operates in the "splenic-flexure syndrome." In this condition, chest pain can be precipitated experimentally when gas accumulates in the splenic flexure as a result of cardiovascular or gastro-intestinal disease or when air is introduced through the rectum. The alternate production and relief of pain in association with the presence and absence of gas in this area has been demonstrated clinically and also shown roentgenographically by visualization of the gas during symptomatic episodes and the absence of gas with the disappearance of the symptoms. In the splenic-flexure syndrome it is believed that the symptom complex is a manifestation of spastic colon. Many observers have shown that accumulations of gas in the colon in various conditions can produce discomfort and pain in the chest or precordial region (4–7).

Emotional disturbances in constipated patients can produce chest pain which is quickly relieved by the passage of flatus (4).

In the so-called "cascade stomach" associated with marked gaseous distention

of the splenic flexure, it has been demonstrated that, following the release of gas, the typical configuration disappears. Buckstein (8) has shown that the stomach may be displaced to the right by gas in the splenic flexure, which serves as a trap for the collection of air or feces. The splenic flexure is situated higher and more nearly posterior than is the hepatic flexure, and it may or may not rest against the diaphragm, depending upon the degree of distention of the flexure and the stomach.

The untoward effect of gaseous distention of the intestinal tract is potentially serious and should be treated vigorously and conservatively at first and then by suction intubation or enterostomy if indicated. Enemas and parasympathetic drugs may be harmful in some cases. Great care must be taken not to overlook the possibility of a compromised visceral blood supply (9).

The idea that angina pectoris is due to irregular spasmodic contractions of the upper intestinal tract, as first presented by Verdun (10) and recently by the Jacksons (11), is based on the well known clinical observation that an attack of angina pectoris sometimes terminates abruptly with the eructation or belching of gas; therefore the inference that the attack is initiated by gas trapped in the stomach or esophagus.

Morrison and Swalm (12) noted that some anginal patients who received no relief from the use of vasodilators and other cardiac drugs often responded to intensive therapy directed to the gastro-intestinal tract. The reflex nature of the attacks was demonstrated by producing sudden cardiac changes in patients with heart disease. In one case, cardiac standstill was caused by blowing up the stomach with air, indicating the possibility of sudden death by accumulations of gas in the viscera. They also observed significant electrocardiographic changes in the S T segment and the production of angina pectoris. In another patient inflation of the stomach with air produced angina pectoris but no electrocardiographic changes; after treatment of the angina, moderate exertion could not be made to reproduce the attack of pain. This indicates the complex nature of the problem and shows that involvement of the coronary artery is not the sole factor.

The fact that both the gastro-intestinal tract and the heart are innervated by the vagus and the sympathetics may explain the interrelationship between cardiac and visceral function, based on the theory of the crossed reflex arc. Anrep (13) showed that the vagus nerve can cause constriction of the coronary artery. Ravdin, Royster and Saunders (14) produced anginal pain by distending the common bile duct with fluid.

SUMMARY

The importance of gastro-intestinal gas in relationship to cardiovascular disease has been emphasized.

The mechanism whereby accumulations of intestinal gas can cause symptoms mimicking those of cardiac disease is complex and cannot be clearly explained at present.

Correction of conditions associated with excess gastro-intestinal gas is of major importance in the treatment of cardiovascular disturbances, and in some cases may tip the balance between life and death.

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Abstracts of Current Literature

THE NATURAL COURSE OF ARTERIOSCLEROSIS OF THE LOWER EXTREMITIES.
Boyd, A. M. *Angiology* **2:** 10 (Feb.) 1960.

Fourteen hundred and forty patients with intermittent claudication due to peripheral arteriosclerosis, but without gangrene or pregangrenous changes, were followed for ten to fifteen years from the time of onset of symptoms. The average age when first seen was 57.2 years. The numbers of patients in various age groups were: age 35–40, 59; 45–54, 360; 55–64, 652; 65–74, 327; and 75 and over, 42. The arteriosclerosis was classified: diffuse, 26.3 per cent; secondary aortic, 0.7; iliac thrombosis (high block), 5.2; secondary femoral thrombosis, 34.2; secondary popliteal thrombosis, 33.6. Statistical analysis gave the following data on all patients (the figures in parenthesis are percents for the 65–74 and the 75+ age groups, respectively)—Chance of survival: to five years, 73.5 per cent (68.2; 49.0); to ten years, 38.8 (34; 13); to fifteen years, 22 (14.8 for the 65–74 year age group). Chance of major amputation: in five years, 7.2 (12; 14.6); in ten years, 12.2 (19.4; 31.9). Chance of nonfatal coronary or cerebrovascular episode: in five years, 20.3 (18.1; 14.4); in ten years, 39.2 (38.3; 26.9). Chance of further arterial thrombosis: in afflicted leg in five years, 10.3; in other leg, 10.6; in afflicted leg in ten years, 17.8; in other leg, 18.6. In an attempt to evaluate the direct attack on segmental occlusions, the following facts were considered: The mortality rate in thrombo-endarterectomy has declined. Now confined largely to the aortico-iliac region, the mortality is 2 to 3 per cent. The mortality of bypass grafting at this level is about the same, but it is less than 1 per cent below the inguinal ligament. The success rate for the former operation is 60 to 70 per cent and for bypass grafting is somewhat higher. This rate is maintained for thrombo-endarterectomy but it falls after bypass grafting especially below the inguinal ligament. Taking into consideration the natural course of the disease, the numbers of patients in whom operation might not be advisable because of age, operative risk, the presence of diffuse arteriosclerosis, the presence of thrombosis of the popliteal artery, and the presence of a contraindication to bypass grafting, it is estimated that only 10 of 100 cases would be suitable for reconstructive surgery. Therefore, it does not have wide application. Furthermore, the value of the operation is open to question because of the good chance of survival even in the older age groups, as shown by the statistics presented. The question arises whether the palliation afforded is worth the operative risk, especially since bypass grafting is the method of choice and the success rates in the two postoperative years have been declining. Investigation of the causes for the late failures has shown that 25 per cent have been due to the development of arteriosclerosis at or beyond the distal anastomosis. In contrast, further thrombosis has occurred within five years in 10 per cent of patients not treated by grafting. This makes it appear that the anastomosis may have hastened the disease at that point because of increased local pressure and disturbance in hemodynamics. Considering the life history and the possibility of chance happenings in patients who have been treated by grafting, only a small proportion of patients with intermittent claudication will have been benefited by operation.

SENILE CARDIAC AMYLOIDOSIS.
Buerger, L., and Braunstein, H. *Am. J. Med.* **28:** 357 (March) 1960.

Senile cardiac amyloidosis represents a distinct variety of amyloidosis which occurs in aged persons of both sexes, and in white and Negro subjects with equal frequency. It is restricted largely to the cardiovascular system. The incidence increases with increasing age but deposition does not appear to be cumulative. Cardiomegaly is not a prominent feature of the disorder but cardiac failure may occur when amyloid is deposited in large quantities. The study revealed neither characteristic symptoms nor specific diagnostic methods by means of which a definite clinical diagnosis may be established. The high incidence of this desease in aged persons should suggest the diagnosis in all elderly patients

with cardiac failure not explainable on the basis of other lesions. A review of the pathologic findings noted at necropsy failed to reveal any specific etiologic factors. An apparent increase in incidence in recent years in the authors' material was restricted to subjects in the tenth decade. (From authors' summary and conclusions.)

STEROID-INDUCED ADRENAL INSUFFICIENCY AGGRAVATED BY SEVERE MEDICAL ILLNESS.

Capper, R. S., and Moser, R. H. *Am. J. M. Sc.* **239:** 261 (March) 1960.

Case histories for 4 patients are presented, each of whom failed to respond to well-conceived and properly executed medication for their widely divergent serious medical diseases. Each did respond to adrenal steroid therapy which was given because unresponsiveness of the adrenal gland was suspected. The patients improved and lost their refractoriness to drug therapy. Later it was found that at some time previously (three years before in 1 instance) the patients had received steroid therapy but none had been able to communicate this information either because of his condition or because the nature of the medication was unknown to the patient. These occurrences were interpreted as indicative of adrenal suppression caused by the administration of steroids, since the evidence did not indicate the spontaneous occurrence of Addison's disease. The disease states induced by steroids are reviewed. This paper shows that not only a surgical procedure but a serious medical illness may precipitate a steroid-induced adrenal exhaustion syndrome. It behooves every physician who plans intensive therapy for a serious illness, or surgery, to determine whether or not a patient has received prior steroid therapy. When a patient is encountered who fails to respond to appropriate, well-executed therapy, the possibility of adrenal unresponsiveness should be considered and treatment instituted with adrenocortical hormone. The authors use hydrocortisone in a dosage up to 300 mg. intravenously for three days and then continue with an oral steroid, basing the dosage and duration upon the patient's condition. These cases add evidence that corticosteroids should be used with great caution in properly selected indications and each treated patient should carry a card giving information as to the preparation he has received, the dosage, the duration, and the condition for which it was administered.

RESULTS OF 1,000 CONSECUTIVE BASAL GANGLIA OPERATIONS FOR PARKINSONISM.

Cooper, I. S. *Ann. Int. Med.* **52:** 483 (March) 1960.

More than 1,000 basal ganglia operations for the tremor and rigidity of parkinsonism have been performed. Of the patients subjected to chemopallidectomy or chemothalamectomy, 80 per cent obtained relief of tremor, rigidity, deformity and attendant symptoms such as bradykinesia and gait and postural abnormalities. The mortality rate for the first 1,000 consecutive operations was 2.4 per cent. The incidence of hemiparesis or hemiplegia was slightly less than 3 per cent. The tremor, rigidity and deformity of parkinsonism can be completely relieved by this type of surgery. Many five-year cures of these symptoms are now demonstrable. Clinical physiologic testing of a reversible lesion placed in the thalamus or other site within the basal ganglia is essential if one hopes to reproduce consistent relief of parkinsonian tremor and rigidity, and to maintain a low incidence of risk. This testing must be combined with correct roentgeno-anatomic localization of lesion placement, and the lesion in each case must be tailored to fit the requirements of the particular patient, if consistently safe and rewarding results are to be obtained. The site of choice for the lesion is the region of the ventrolateral nucleus of the thalamus. Such a lesion includes the reticular nucleus of the thalamus, the zona incerta, and afferent fibers to the thalamus from the globus pallidus, cerebellum, red nucleus and vestibular nucleus, as well as the efferent fibers to the cerebral cortex. The meticulous selection of candidates for surgery is as important as the meticulous performance of the operation. Patients in the seventh and eighth decades of life may be operated upon with the same possibility of

benefit as those in the younger group, as long as they are selected in accordance with the requisites described. The incidence of good results achieved by surgery will be directly proportional to the judgment and insight exercised in the selection of surgical candidates. Surgical treatment of parkinsonian tremor and rigidity is now indicated relatively early in the course of the disease. Male patients should be operated upon before it is necessary for them to give up gainful employment. Female patients should be operated upon before they become unable to carry out their activities of daily living. Surgical therapy now is applicable to a large percentage of the parkinsonian population. Although medical therapy deserves a complete and definitive trial in each case, surgical therapy has certain irrefutable advantages once the case has been demonstrated to be progressive, and to threaten interference with the activities of daily living and eventual incapacitation. Surgical therapy can provide rapid and often complete relief of tremor, rigidity and deformity, and the attendant motor symptoms of bradykinesia, poverty of movement and other functions—often to a remarkable degree. Not only does surgical therapy abolish these symptoms or reverse the deformities present, but it has also now been demonstrated that such relief of hyperkinetic phenomena has endured following operation for as long as six years, which is the present time-limit of this study. Five- and six-year cures of tremor, rigidity and motor abnormalities, without any evidence of recurrence, are well documented. In many instances there has been amelioration of the secondary parkinsonian symptoms, such as masked facies, excessive sweating and oculogyric crisis. However, it is to be emphasized that surgery is indicated only when the primary symptoms of tremor and rigidity are paramount. Surgical therapy offers the sole means not only of reversing the motor symptoms which are present, but also of halting the progression of the disease in the extremities which are alleviated of these symptoms. (From author's summary and conclusions.)

HYDROFLUMETHIAZIDE. THE CLINICAL PHARMACOLOGY OF A NEW ORAL DIURETIC. Dennis, E. W., and Ford, R. V. *Am. J. Cardiol.* **5:** 402 (March) 1960.

The significant part of the dose-response curve for hydroflumethiazide was between 25 and 50 mg. The average increases in urinary sodium were 84 and 134 mEq. per twenty-four hours for the 25 mg. and 50-mg. doses, respectively. The potency of hydroflumethiazide at a 50-mg. dose level was found to be 1.3 times that of meralluride (Mercuhydrin), that is, 2 ml. of meralluride intramuscularly equals 40 mg. of hydroflumethiazide orally. Hydroflumethiazide caused an increase in sodium excretion which reached a peak at six and twelve hours and lasted at least eighteen hours. Potassium and bicarbonate excretion increased slightly, but to an extent less than with chlorothiazide. The drug was effective upon repeated administration and not associated with a significant change in serum electrolyte structure. Hydroflumethiazide proved effective in the relief of edema of cardiac, steroid, cirrhotic and nephrotic origin and in the edema of pregnancy. That the drug is an effective antihypertensive agent was demonstrated by administering it to patients who had received no previous antihypertensive therapy, patients who had been receiving rauwolfia, patients inadequately controlled with a combination of rauwolfia and mecamylamine, and patients fairly well controlled with rauwolfia, mecamylamine and chlorothiazide.

ALTERNATION OF ESTROGEN THERAPY IN ADVANCED CARCINOMA OF THE PROSTATE. Desberg, D. *J. Urol.* **83:** 463 (Apr.) 1960.

Among 29 patients with carcinoma of the prostate studied for a year, 7 had increased induration or other adverse signs that necessitated a change in estrogenic therapy. All responded satisfactorily when another estrogenic preparation was substituted. The testes were intact, so that estrogenic effects could be evaluated. Estrogens were used in the following order: polyestradiol phosphate (Estradurin), diethylstilbestrol, ethinyl estradiol (Estinyl), and tri-para-anisylchloroethylene (TACE). Three methods of evaluation were used: determination of the degree of induration of the prostate, estimation of the prostatic serum acid phosphatase, and x-ray studies of the chest and bones. Patients who were free

of signs of advancing induration or extension, or in whom there was decreased induration or extension, continued to receive the same estrogenic preparation. If induration was increased, prostatic serum acid phosphatase studies were made, and estrogen therapy changed. The lymph gland area was examined at this time, and a chest and bone survey made. A third estrogen was substituted if there was no response to the second one. Routinely, a chest and bone survey was made every six months. Although this plan was successful, there is as yet no satisfactory explanation for the phenomenon of altered estrogen sensitivity.

MYOCARDIAL INFARCTION AND OTHER ELECTROCARDIOGRAPHIC CHANGES IN THE POSTOPERATIVE PERIOD.

Driscoll, A. C.; Hobika, J. H.; Etsten, B. E., and Proger, S. *Bull. Tufts-New England M. Center* **6:** 1 (Jan.–March) 1960.

Among 496 unselected patients, 12 (2.4 per cent) had a myocardial infarction postoperatively. All were over 50 years of age. Therefore, the incidence among the 271 persons in the study who were beyond this age was 4.5 per cent. Six of the infarctions would have been missed had not this electrocardiographic study been made postoperatively. The diagnosis was suspected clinically in 4 patients. Ten of the 12 patients had one or more of the following preoperative complications: clinical coronary heart disease, hypertension, peripheral vascular disease, or diabetes mellitus. The incidence of these complications in the entire group was 30 per cent, and in the older age patients 47.5 per cent. The 2 patients who preoperatively did not have clinical coronary heart disease did have abnormal electrocardiograms before operation. Only one of the surgical procedures was in a minor category. General anesthesia was used eleven times and spinal anesthesia once in the patients with a myocardial infarction. Surgery in 7 of them lasted more than three hours as it did also in 45 per cent of the 271 patients in the group over age 50. Seven of the 12 patients with an infarction had significant hypertension during or after surgery. Ten of the patients fared well postoperatively, and 2 died within seven and eleven days, respectively. Thirty patients, 23 of whom were over age 50, had inversions of the T-wave postoperatively, but these were not marked nor as persistent as the changes in the patients with an infarction. Only 10 of these had entirely normal electrocardiograms preoperatively. Half of them had clinical coronary heart disease, hypertension, diabetes, or peripheral vascular disease—an incidence greater than in the total series. Postoperatively, all did well and there was no clinical evidence of acute coronary heart disease. This study indicates the justification for making electrocardiograms twenty-four hours following operation in persons over age 50 with known coronary heart disease, abnormal electrocardiograms, or the other complications noted in the patients with an infarction. There should be no tendency, however, to diagnose myocardial infarction too frequently in patients with minor or transient T-wave inversions since, in the postoperative period particularly, these may be due to extracardiac factors.

WILMS TUMOR IN THE ADULT.

Fitzpatrick, R. J., and Dyrenforth, L. Y. *J. Urol.* **83:** 351 (Apr.) 1960.

Two cases of Wilms tumor are described. The exact incidence of this tumor is not known because of confusion in the literature as to authenticated cases. Furthermore, there is no agreement as to what kidney site is most frequently involved. The authors believe that clinically, histopathologically and histogenetically there is such an entity. In Case 1, the kidney was distorted by a mass, replacing its lower half, which was nodular in outline and contained areas of necrosis and hemorrhage. Microscopically it showed a sarcomatous type of stroma with abortive tubules and glomeruli. The tumor in the second patient was surrounded by a benign lipoma which, because of distention, caused hemorrhage from its superficial blood vessels. The cortical and medullary portions of the kidney contained three areas of yellow-gray color. Microscopically there was a sharply encapsulated cellular tumor.

The spindle to ovoid nuclear type cells showed indefinite cytoplasmic outlines and acinar grouping. Striated and smooth muscle fibers were seen. Budlike processes suggested abortive glomeruli with surrounding Bowman's spaces. Two other cases of Wilms tumor were seen at necropsy but data on them were not available.

THE CLINICAL PHARMACOLOGIC INVESTIGATION OF A NEW BENZOTHIADIAZINE DIURETIC, CMR-807.

Ford, R. V. *Am. J. Cardiol.* **5:** 407 (March) 1960.

The significant part of the dose-response curve for CMR-807 (3-dichloromethyl-6-chloro-7-sulfamyl-3, 4-dihydro-1, 2, 4-benzothiadiazine-1, 1-dioxide), known as Naqua, was between 4 and 8 mg. The average increases in urinary sodium over the control at the 4-mg. and 8-mg. dose levels were 106 and 168 MeQ. per twenty-four hours, respectively. Naqua was estimated to be 1.7 times as potent as meralluride intramuscularly, that is, a 4-mg. dose of Naqua orally equals a 1.75-ml. dose of meralluride intramuscularly. Naqua caused an increase in sodium excretion that appeared within two hours after administration, reached a peak in six hours, and lasted for more than twenty-four hours. The slight increases in potassium and bicarbonate excretion were not as great as seen with chlorothiazide. Naqua showed repetitive effectiveness without significant changes in electrolytes. Administration to patients who had not previously received antihypertensive drugs, patients who had been controlled with rauwolfia, patients inadequately controlled with rauwolfia plus mecamylamine, and patients controlled fairly well by a combination of rauwolfia, mecamylamine and hydrochlorothiazide showed the drug to be effective as a hypertensive agent. It also indicated that the drug could replace presently used diuretics such as chlorothiazide, but it was not determined whether it was more effective than hydrochlorothiazide. Naqua effectively controlled edema of the cardiac, steroid, cirrhotic, nephrotic and premenstrual type. It appeared to possess an advantage over other diuretics, including hydrochlorothiazide, for this use. No indications of toxicity or clinical reversal were observed with even twice the maximum effective dose of 8 mg.

UROLOGIC USES OF PANCREATIC DORNASE: PRELIMINARY CLINICAL TRIAL.

Glenn, J. F. *J. Urol.* **83:** 485 (Apr.) 1960.

Pancreatic dornase (Dornavac), an enzyme which reduces the viscosity of purulent material, was used as an adjunct to therapy in 14 urologic patients with purulent conditions of the urinary tract. Dornase was utilized for irrigations in doses of 100,000 to 300,000 units in 10 to 30 ml. of saline. Irrigations were accomplished one to four times daily for five to ten days. No serious side-effects, toxicity, or sensitivity reactions were observed. In all instances there was prompt and readily discernible reduction in viscosity of the purulent material, with resulting improvement in urinary drainage. Dornase appears to be a safe and practical adjunct in the management of patients with purulent urinary infections and postoperative patients with tenacious pus in the urinary tract. (From author's summary.)

A NEW CONCEPT OF CARDIAC FAILURE.

Kisch, B. *Am. J. Cardiol.* **5:** 383 (March) 1960.

Electron microscopic examination of biopsy specimens of the heart obtained within ten minutes after death showed that not only are there intercellular and intracellular biochemical changes in the failing heart, but recognizable morphologic changes in the appearance and number of enzyme-bearing sarcosomes—probably a causative factor. The function of the enzyme system of the heart probably is interfered with in heart failure by a diminished number of sarcosomes and by inhibiting effects of the disintegrating sarcosomes. The degenerated sarcosomes are osmiophilic and this suggests a lipid characteristic. Possibly the disintegration products yield the lipid materal present in the heart under such conditions, rather than it being brought by way of the circulation. This idea is supported by the fact that osmiophilic bodies were found in the specimens at the site where in a nor-

mal heart a great accumulation of sarcosomes could be found, and by the difference in appearance of the fat droplets deposited in the heart and the transformed sarcosomes seen in the specimens. The hypothesis is suggested that most of all known diseases are conditions in which a greater part of the plasmasomes (mitochondria) of one or more tissues of the body are not working normally due to their disorganization (swelling or disappearance of their lamellar structure) or complete disintegration (destruction of their membrane or osmiophilic transformation of their contents).

NEUROPSYCHIATRIC PRESENTATION OF HYPERCALCEMIA.

Lehrer, G. M., and Levitt, M. F. *J. Mt. Sinai Hosp.* **27:** 10 (Jan.–Feb.) 1960.

Three patients were referred for neurologic consultation because of severe mental changes with symptoms referable to the nervous system. No diagnosis could be made until a high serum calcium level was discovered. In 2 patients fluctuations in this level were correlated with changes in mental status: as the level rose, confusion increased. The causes were found to be hypervitaminosis D, possible hyperparathyroidism, and Hodgkin's disease. All 3 patients showed moderate, diffuse slowing in their electroencephalograms, accompanied by diffuse bursts of 1.5 to 2.5 cps activity. One patient recovered with clearing of the hypercalcemia during a period of low-calcium diet. Changes in mental status or confusion in patients with hypercalcemia are not stressed in textbooks. There is no specific way to characterize the hypercalcemia, but it is usually accompanied by lassitude, drowsiness, and occasional stupor or coma. The patient may be disoriented and confused, have a poor memory, have difficulty in calculating, and have a short attention span. The face-hand test is likely to yield positive results. There may be incontinence of urine and feces. Hypercalcemia should be suspected when these symptoms are accompanied by anorexia, nausea, vomiting, epigastric pain, muscular weakness, constipation, or polydipsia and polyuria. It also should be considered in patients with an organic mental syndrome, the etiology of which is obscure. Since the cause of hypercalcemia can sometimes be eliminated or the serum calcium level lowered (as with ethylenediamine tetraacetic acid), and since hypercalcemia when prolonged may cause severe renal tubular damage or death, early diagnosis is essential. Besides the causes in the cases presented, others may be the milk-alkali syndrome, Boeck's sarcoid, prolonged administration of large doses of estrogen or androgen, metastatic malignancy of bone, multiple myeloma, and prolonged immobilization.

EVALUATION OF RAUWOLFIA SERPENTINA WITH FLUMETHIAZIDE IN HYPERTENSION.

Lotterhos, W. E. *J. Mississippi M. A.* **1:** 151 (Apr.) 1960.

Twenty-two female patients aged 76 to 91 years with moderately severe hypertension were treated with Rautrax (50 mg. of *Rauwolfia serpentina* with 400 mg. of flumethiazide and 400 mg. of potassium chloride per tablet) in a dosage of one to three tablets daily. Each had previously been under treatment for hypertension. The mean blood pressure declined in all patients, the response being judged good in 18 patients, fair in 2, and poor in 2. Declines of 20 mm. Hg or more in systolic pressure occurred in 20 patients, and in diastolic pressure in 11 patients. Complaints of weakness and fatigue sometimes ceased after therapy was instituted. There were no side-effects. It is concluded that Rautrax is safe and effective for use in hypertension in elderly persons.

THE EFFECT OF A NEW CARBONIC ANHYDRASE INHIBITOR (DICHLORPHENAMIDE) IN RESPIRATORY INSUFFICIENCY.

Naimark, A.; Brodovsky, D. M., and Cherniack, R. M. *Am. J. Med.* **28:** 368 (March) 1960.

Dichlorphenamide has a capacity to inhibit carbonic anhydrase which is estimated as 30 times that of acetazolamide. It was given to 15 patients with chronic respiratory insufficiency in whom hypercapnia persisted despite therapy with antibiotics, bronchodil-

ators, digitalis, diuretics, oxygen and intermittent positive-pressure breathing. Dichlorphenamide was added to the regimen in a dosage of 200 mg. and administered for periods of two to thirty weeks. All but 1 patient experienced sustained improvement with less dyspnea, increased effort tolerance, and a sense of well-being. Side-effects consisted of mild nausea in 2 patients and severe headache in 1. Besides a reduction in hypercapnia in the patients who improved there was a rise in arterial oxygen tension and a decrease in arterial CO_2 content during treatment. The calculated arterial pH increased initially and then tended to return to its original value. The alveolar oxygen tension rose in 7 of 9 patients studied. The alveolo-arterial oxygen tension was greater in 5 of these patients, but fell in 2 during administration of the drug. Alveolar ventilation also increased in the 7 patients in whom a rise in alveolar oxygen tension was noted. This was associated with an increase in minute ventilation and usually with slowing of respiratory rate and increase in tidal volume. The ventilatory response to a given change in arterial CO_2 tension (inhaled CO_2) was unaltered during the administration of dichlorphenamide. Oxygen consumption and CO_2 elimination showed no consistent trends during the administration of dichlorphenamide. A diuretic effect was noted in 2 patients. Administration of the drug resulted in marked chloruresis in 2 patients receiving a standard ward diet but not in 1 patient receiving a fixed sodium and chloride intake. Metabolic acidosis developed in this patient but not in the former 2. Dichlorphenamide appears to have two mechanisms of action: an effect on the respiratory center that results in an increase in ventilation and lowering of CO_2 tension, and a renal effect that causes marked excretion of sodium and bicarbonate and accounts for the production of metabolic acidosis.

A STUDY OF PSEUDOMEMBRANOUS ENTEROCOLITIS.

Pearce, C., and Dineen, P. *Am. J. Surg.* **99:** 292 (March) 1960.

A study was made of 9 fatal and 3 nonfatal cases of pseudomembranous enterocolitis occurring postoperatively during a recent five-year period. Only 2 of these patients underwent operative procedures on the colon. Fever and diarrhea were the most common initial manifestations of the disease, and appeared an average of 5.7 days after operation. Prior to the onset of enterocolitis all patients had received antimicrobial therapy, which in almost all instances was given by the parenteral route only. Gram-positive cocci were identified as the sole or predominant organism in stool smears, and hemolytic *Staphylococcus aureus* was cultured from the stools of all except 1 patient on whom these studies were performed. The importance of prompt diagnosis and treatment is indicated by an average delay of only 5.7 hours in initiating therapy in those patients who survived, and a delay of forty hours in fatal cases. Death occurred an average of less than five days after the onset of symptoms. Pathologic changes were typical of those previously described and usually involved extensive areas of the colon, small intestine and, occasionally, the stomach. Evidence from this and other recent studies indicates that alteration of the bowel flora by broad-spectrum antibiotics with resultant overgrowth of hemolytic *Staphylococcus aureus* accounts for most cases of pseudomembranous enterocolitis at the present time. Three objectives should be sought in treatment: elimination of hemolytic staphylococci and establishment of the normal flora of the bowel; restoration of water, electrolytes, and protein in the body; and reduction of toxicity. (From author's summary.)

UNEXPLAINED HEART FAILURE IN THE AGED.

Rose, G. A., and Wilson, R. R. *Brit. Heart J.* **21:** 511 (Oct.) 1959.

An analysis is presented of the clinical and postmortem findings in 50 patients who died at age 70 years or older with heart failure for which no adequate explanation could be found. They were compared with the findings in a group of 50 patients, matched for age and sex, in whom prior to death there was no reason to suspect heart disease. The heart failure could probably be divided etiologically into three groups—former hypertension, clinically unrecognized coronary disease, and cases in which the heart at necropsy appeared

completely normal. The last might possibly be examples of "senile heart failure." Auricular fibrillation, which was common in all etiologic groups and also among the control subjects, did not appear to be related to coronary disease.

EPILEPSY IN THE AGING AND AGED.
Schwade, E. D. *Geriatrics* **15:** 11 (Jan.) 1960.

Epilepsy occurs in 8 to 10 per cent of patients over age 60. Among the more common causes of seizures that commence in elderly people are space-occupying lesions of the brain, telangiectasia, and local thrombosis. When there are local neurologic or electroencephalographic findings, neurologic and neurosurgical investigation into the etiology is mandatory. Sometimes focal temporal-lobe epilepsy responds well to surgery, but treatment is primarily medical. Seizures occur in 5 basic patterns: *Petit mal*, or minor seizures, are rare in elderly people. The electroencephalogram shows a 3-second spike and dome pattern in the frontal area with spread to the entire brain. *Grand mal* is a major convulsive seizure. The attack in elderly persons is of shorter duration than in younger ones, tends to "burn itself out," and is not followed by drowsiness or fatigue. The electroencephalogram shows clusters of spikes or isolated spikes in any area of the brain. In a *psychomotor seizure*, the patient automatically carries out any initiated activity without being aware of doing it. The electroencephalogram shows slow waves and positive spiking, or only the latter in any area of the brain. These seizures tend to be focal. *Myoclonic seizures* are rare in elderly persons. The attack is brief, with sudden pronounced jerking in the extremities or face, of which the patient may be aware. The electroencephalographic pattern shows relatively high amplitude, sharp spiking in any area, and after a few spikes, high amplitude waves of 2 to 3 seconds. In an *akinetic seizure*, the patient becomes limp and may slip to the floor. Consciousness returns in a few seconds. This type of attack may occur only at night. Anticonvulsant drugs, the therapy of choice, have the following benefits and disadvantages: *Diphenylhydantoin sodium* (Dilantin): Effective in grand mal and with other drugs in psychomotor seizures. Dosage, ½ to 1½ gr. three to four times daily. Side-effects: gingival hyperplasia and cerebellar symptoms (from overdoses). *Methylphenylethyl hydantoin* (Mesantoin): Useful in grand mal and psychomotor seizures and in akinetic seizures provided care is used in dosage; less effective in petit mal and focal type seizures. Side-effects: gingival hyperplasia (less than with Dilantin), drowsiness, lassitude, pruritic morbilliform rash, tendency to hypochromic anemia and leukopenia. Dosage should be commenced with minimum quantities, and the patient should be followed by means of frequent blood counts. *Phenacemide* (Phenurone): Useful for grand mal and psychomotor seizures; may be effective in combination with other drugs in petit mal and akinetic seizures. Dosage, 250 to 1,000 mg. per day with careful supervision of the patient and watching for evidence of liver damage, blood dyscrasias, irritability and paranoid trends. This drug is valuable for treatment of elderly people. *Ethotoin* (Peganone): Its best use is in grand mal; it is less useful in psychomotor and akinetic seizures. The least toxic hydantoin, it produces no side-effects except drowsiness when given in large doses. *Primidone* (Mysoline): Effective in grand mal and psychomotor seizures. The initial dosage should be small and the patient watched for hypochromic anemia and leukopenia. It may be used in combination with other anticonvulsants, but when combined with hydantoins, the tendency to blood dyscrasias becomes more pronounced. *Trimethadione* (Tridione): Used for petit mal, and for myoclonic and akinetic seizures. It should be tried in combination with other anticonvulsants in aged people. It can stimulate grand mal seizures in a patient subject to both grand mal and petit mal attacks. From a minimal amount, the dosage may be increased to 900 mg. to 2.1 Gm. daily in divided doses. Blood dyscrasias must be watched for; the drug may also cause photophobia and a morbilliform type of rash. It is contraindicated in persons receiving a ketogenic diet because of the presence of magnesium trisilicate. *Paramethadione* (Paradione): Valuable for petit mal, myoclonic and akinetic seizures, and in brain damage when symptoms are associated with any of these kinds of attack. It has proved more effective in aged

persons than has Tridione. The initial dosage is 900 mg. in divided doses. Side-effects: rash, photophobia, and blood dyscrasias. *Mephobarbital* (Mebaral): It may be used in any type of epilepsy. It is less sedative than phenobarbital, but has a somnolent effect in large doses. It occasionally causes a rash. Dosage in elderly people is ½ to 1½ gr. three or four times daily given with other anticonvulsants. Other drugs used in epilepsy are methsuximide (Celontin) and phensuximide (Milontin), which are less effective; acetazolamide (Diamox), which is used in conjunction with other anticonvulsants; α-ethyl-α-methyl-succimide and trimethyl-isocyanurate, which are new and show promise in petit mal; and chlormerodrin (Neohydrin) and chlorothiazide (Diuril), which are used as adjuncts for diuresis. The safest of all anti-epileptic drugs is phenobarbital which, along with other anticonvulsants, is effective in each type of epilepsy. Besides the use of drugs, an important measure in treatment is limitation of fluids, as an excess tends to produce more seizures.

HEMODYNAMIC PATTERNS IN CHRONIC CARDIAC FAILURE.

Selzer, A., and McCaughey, D. J. *Am. J. Med.* **28:** 337 (March) 1960.

A study was made of 50 patients with chronic left-sided cardiac lesions (hypertensive arteriosclerotic cardiac disease, aortic valve lesions, and myocarditis) who entered the hospital in a state of overt cardiac failure. All were given conventional treatment for cardiac failure and were observed clinically until "dry" weight was attained and they were rendered asymptomatic at rest. Four-fifths of the patients then showed no clinical evidence of cardiac failure and many were able to resume normal activities. At this point cardiac catheterization studies were performed for the purpose of assessing chronic residual hemodynamic changes in patients who recovered from cardiac failure. Only 1 patient had an entirely normal pattern of circulatory dynamics. Forty-nine patients fell into one or another of the following hemodynamic groups: 1) normal resting dynamics with an abnormal response to exercise; 2) normal resting left atrial pressure with an abnormally low resting cardiac output; 3) elevated left atrial pressure with a normal resting cardiac output; 4) elevated left atrial pressure with an increase in pulmonary vascular resistance and a low cardiac output. Nine patients in the last category were found to have marked pulmonary hypertension with a pulmonary vascular resistance more than 600 dynes/second/cm^{-5}. The findings are interpreted as showing qualitative differences in the adaptation of the circulation to chronic left ventricular overload. In cases in which normal circulatory dynamics can no longer be re-established, the heart can adapt itself 1) by maintaining an abnormally low cardiac output and a normal or near-normal left ventricular filling pressure, and 2) by preserving a normal cardiac output at the expense of a continued increase of left ventricular filling and left atrial pressures. The latter group of cases represents chronic left ventricular failure, analogous to mitral stenosis in that a stimulus is provided for the frequent development of increased pulmonary vascular resistance with its restricting influence upon cardiac output. (From authors' summary and conclusions.)

HYPERSENSITIVITY ANGIITIS OF THE LUNG. REPORT OF A CASE ASSOCIATED WITH PULMONARY MONILIASIS.

Sivertson, S. E., and Jaeck, J. L. *Wisconsin M. J.* **59:** 197 (March) 1960.

The first reported case of hypersensitivity angiitis (Zeek classification) associated with pulmonary moniliasis is presented, and the pertinent literature reviewed. At present the diagnosis is made by elimination, but biopsy of suitable material, if possible, may be diagnostic. Hypersensitivity angiitis should be considered in cases of pneumonia which do not respond to the usual therapy. Cortisone-like drugs may be life-saving. It is apparent that the entity called periarteritis nodosa is not a single disease, but consists of several types differing in both pathologic and clinical characteristics: 1) periarteritis nodosa, primary and secondary; 2) hypersensitivity angiitis (pneumonic type of Rose and Spencer); 3) rheumatic arteritis; 4) allergic granulomatous angiitis of Churg and Strauss (asthma type of Rose and Spencer); and 5) temporal arteritis. Etiologic differentiation is a problem for

the future. Pulmonary moniliasis and/or hypersensitivity angiitis complicating antibiotic therapy poses a therapeutic dilemma. (From authors' summary.)

CARCINOMA OF THE GALLBLADDER AND ACUTE CHOLECYSTITIS.
Thorbjarnarson, B. *Ann. Surg.* **151:** 241 (Feb.) 1960.

Ten cases show that carcinoma of the gallbladder may be recognized during the operation for acute cholecystitis. The true nature of the diagnosis was not realized preoperatively since the signs and symptoms were those of typical cholecystitis. These 10 cases represented 11 per cent of 90 cases of gallbladder carcinoma among 5,000 operations for diseases of the biliary tree. The tumor was not recognized during the operation in 4 of these 10 patients because 1) in 1 case there was a perforation with abscess formation, 2) a hard tumor of the ampulla was taken to be an impacted stone, 3) the tumor was found only by microscopic examination, and 4) the significance of a hard and thickened fundus was missed. The tumor was not removed from 3 patients. Two of these died within a short time, but the third survived five years. Seven tumors were resectable. Five of these were early cases and only 1 had metastasized to the cystic-duct lymph node. Four of these patients survived an average of twenty-three months, 1 survived for ten months, and 2 are alive at two and ten years postoperatively, respectively. The results of treatment in this group were better than in an unselected group of patients with carcinoma of the gallbladder, considering both curative and palliative effects, probably because of earlier removal of the tumor.

NEWS AND NOTICES

MORE NURSING HOMES SEEN ESSENTIAL

An expansion of nursing homes facilities is badly needed to provide for the growing number of older persons who cannot otherwise be cared for, according to a new pamphlet *Private Nursing Homes* obtainable for 25 cents from the Public Affairs Committee, 22 East 38th Street, New York.

The pamphlet states: "By any measuring rod, the nation's 25,000 nursing homes with 450,000 beds do not meet our needs. It is estimated that 323,000 additional beds are needed."

"In summary, the ingredients of the problem are these: We are adding millions of older people to our population. Many of them are ill, requiring almost constant care at best and highly specialized nursing services in many instances. Present-day families are not able, except in unusual cases, to provide this kind of care at home . . ."

"What is needed is an intermediate kind of service, midway between the unskilled care of an attentive but untrained housewife and the expensive, complex services of a general hospital."

The pamphlet contains general advice to any family which is searching for just such nursing care. It points out that the first essential of a good nursing home is to "provide a happy environment, attention to individual needs, and personal courtesy. It will understand the need to keep the patient active, physically and mentally, and to keep his morale high."

In view of the fact that existing nursing homes vary widely in the quality of the service rendered, and patients differ widely in their requirements, it is suggested that particular attention be paid to the qualifications and ability of the administrator, to the quality of medical care available, to food, to recreation services and, above all, to the quantity and quality of the nursing services.

"Money is the root problem in nursing home care," the pamphlet emphasizes. "The patient's limited ability to pay is the measure of the services which can be rendered and the facilities that can be provided in the proprietary homes which form the core of the nation's nursing home services."

"Costs and charges vary tremendously from place to place, but there are also great variations in cost depending on the types of service offered."

"Best available estimates are that adequate nursing home service costs $150 a month and up. The 'and up' extends to $500 and beyond . . . But more than half the patients in our nursing homes are dependent on public assistance payments for all or most of their support . . . A survey by the Social Security Administration showed an average monthly payment to nursing home patients of $113 in old-age assistance."

"The contrast between private payments and the amount available through public assistance points to an unavoidable conclusion. The homes whose patients are chiefly dependent on public funds can scarcely be expected to furnish all of

the desirable services. Nevertheless, they can and should . . . provide human kindliness, sympathy, and sincere interest."

"Ideally, the nursing home should work hand in hand with the local medical, dental and nursing professions, with the public health and welfare agencies, and with voluntary groups. Community groups and civic clubs in quest of a project would do very well to begin to work with their nursing homes. They can be of enormous service within the homes, and the old people of the community would profit beyond measure."

Private Nursing Homes is the 298th booklet in the Public Affairs Pamphlet series which is now in its twenty-fifth year. The series has included many other distinguished titles covering social and economic problems, family relations, health and science, and intergroup relations.